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W. J. JOHNSTON, President. F. J. PRATT, Treasurer

T. A. RICKARD . . . . . EDITOR

FREDERICK HOBART, JOSEPH STRUTHERS, SAMUEL SANFORD . . . . . Associate Editors

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THE LIQUIDATION in Wall Street, about which our contemporaries have had so much to say, appears to have had very little effect upon general business. Upon the whole, the settlement of prices of stocks to lower figures than were reached during the boom of last year, will have a beneficial effect. The total amount of bank clearings reported has, it is true, fallen off from that of the corresponding period a year ago; but this decrease has been almost entirely in the New York banks, and has been due to the lessened volume of speculative transactions. The amount of money required for general trade and manufacturing shows no material change, and the evidence is that the banks, in limiting stock loans, have been able to find a sufficient supply of money for legitimate business demands, while, at the same time, placing themselves in a strongr position. The recent gold shipments abroad, while they have operated to reduce our foreign indebtedness, can hardly be said to have affected our own supply, since they have been considerably less in amount than our actual production this year, and our receipts from the Canadian Yukon. Upon the whole, the situation appears sound, and the lower prices made in the iron and other markets will have the effect of increasing rather than reducing the volume of manufacturing and of construction.

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THE SUGGESTION of a correspondent, made in this issue, that the Rand mine managers consider the employment of Tatars, is worthy of serious investigation. The writer of this note knows the good-natured willing folk to whom our correspondent refers, having seen them employed in the copper mines of the Urals. They are certainly preferable to the Chinese, or to other Asiatic coolies. From latest advice it appears that the London share market is keenly on the alert to know what will be the outcome of the labor problem, and while rumors of the engagement of Chinese have been premature, their prompt denial has not squelched the long deferred hope that something would at last be done. To us, at a distance, it would seem unlikely that any Chinese will be imported until the Transvaal legislature give its sanction to such a far-reaching innovation, and of this there is no certainty, on account of the opposition of a large portion of the labor element at Johannesburg. In investigating the best means to put the mines of the Rand on a proper footing, in regard to sufficiency of laborers, we would suggest that both the American negro and the Russian Tatar should receive consideration.

⚒

THE APPOINTMENT of Mr. J. T. Morrow to the management of the Greene Consolidated Mine, at Cananea, Mexico, and that of Mr. Arthur S. Dwight as consulting engineer to the same property, were announced in this JOURNAL last week. In our issue of March 28 we criticised the directorate of this well-known copper enterprise, because it had not, on its technical staff, such professional men as the size of the undertaking would seem to warrant. We stated frankly that a copper business, of the magnitude indicated, could not expect to be considered well organized until it had as technical advisers one or two men of acknowledged standing. The grounds for that particular criticism have been removed and it gives us pleasure to congratulate the Greene Consolidated Company on having secured the services of two metallurgical engineers of the first rank.

⚒

GOOD PROGRESS continues to be made in the treatment of sulpho-telluride ores at Kalgoorlie. The Diehl process is making further strides and we are informed that the cost of treatment at the Lake View Consols mine has been reduced to 16.25 shillings, equivalent to $3.90 per ton. Experimental work on concentration is still going on, and it is a nice question which process—concentration or bromo-cyanide—is to command the field. At the Golden Horseshoe it was found, in concentration practice, that when the sulphides present amount to 0.5 per cent the extraction is unsatisfactory; as a consequence the Diehl process was recently adopted. This justifies the prognostications of Mr. Alfred James, as made in our issue of January 3 last.

The adoption of pumps for filling filter-presses in place of montejus has gained ground, and Mr. Hamilton is installing this method at the Great Boulder mine. In this connection there is much complaint over the poor quality of many of the filter-frames which are manufactured in England, and it appears to us that there is an opening in this country also for the production of a high-class filter-frame which will meet the exacting requirements of the best cyanide practice.

At Kalgoorlie the Merton furnace is doing good work. We hope shortly to give our readers full details. At the Great Boulder Mine each furnace easily roasts per day 18 tons of ore, containing 4 to 6 per cent of sulphur, with a fuel consumption of 12

per cent of the weight of the ore. One man runs these furnaces and the cost is estimated at 3 shillings, or 75 cents, per ton, including the proper charge for general expenses and repairs to furnace.

⚒

IN ANOTHER COLUMN we give the report of the Commission, appointed under the Indiana Bituminous Coal Agreement of April last, to determine the question of the employment of shot-firers in certain coal mines in that State. It will be seen that the opinion of this Commission is very much in line with that of the Illinois coal operators, recently reported in the JOURNAL. It is not believed that the appointment of shot-firers will lessen the danger of explosions of gas or dust. In fact, it may increase this danger by inclining the miners to be more reckless and careless in their daily work. The only reason why the Commission recommends, or rather consents to, the demand of the miners for the appointment of shot-firers, is that it will diminish the risk to life, from the fact that the firing will be done at a time when there are very few people in the mine. The conditions in several of the mines examined are favorable to disastrous dust explosions, but the risk of those explosions will not be at all decreased, by the fact that shot-firers are employed, as above stated. The demand of the miners in this case, as in Illinois, appears to be a purely selfish one, the object being to confine the risks to the few men who may be selected to do the shot-firing work.

⚒

PROGRESS IN ALASKA.

On another page we publish a practical estimate of the costs of working gold-bearing gravels in Alaska and in the Klondike region, together with suggestions concerning the methods which are best suited to local conditions.

These suggestions are timely. There is much interest in Alaska at the present time. The flotilla of steamships, which have begun to go forth from Puget Sound, carry with them more than 3,000 passengers and a big tonnage of freight. In the latter is included an unusually large proportion of mining machinery and railroad material.

There is no doubt that the excitement of 1898 and the two succeeding years does not represent the high-water mark in the mining industry of the Far North. Most gold-producing regions begin with a spectacular stampede, and it is only when the first rush is over that legitimate mining on a permanent basis begins to take hold. Everything points to the fact that while the cream may have been skimmed from the diggings which made the Klondike and Cape Nome so attractive to the adventurous of all countries, nevertheless there remains much alluvial ground which, while not as rich as the first pickings, is yet profitable and very extensive. The output of these Arctic regions for the past year is estimated at $25,800,000. This includes the Klondike, Forty-Mile, Atlin and Nome districts, in all of which the clean-ups for the season have been satisfactory. In 1902 the mines on the Canadian side produced $18,000,000, while those of Alaska proper yielded $7,800,000. It is stated that the Canadian Government is being importuned to suspend the duty on American machinery for two years, in order to encourage the introduction of American hydraulic and dredging equipments into the British Yukon, the Canadian manufacturers being unable to furnish all that is required. We hope any reasonable departmental concessions, helpful to the development of the country, will be accorded in good spirit by both of the governments which divide the control of this big stretch of mining territory.

President Roosevelt, while at Seattle, laid stress on the future greatness of Alaska. He is quoted as saying: "I predict that Alaska, within the next century, will support as large a population as does the entire Scandinavian Peninsula of Europe, the people of which, by their brains and energies, have left their mark on the face of Europe. I predict that you will see Alaska, with her enormous resources of mineral, fisheries, her possibilities that almost exceed belief, produce as hardy and vigorous a race as any part of America." We are among those who believe in the Great Northwest as the future home of a large agricultural and mining population. The wheat-lands on the eastern slope of the Rocky Mountains, in Alberta and Assiniboia, have already taken their place as one of the granaries of the world, and on the western side of the continental divide there is a stretch of country which for mineral resources is hardly surpassed by any portion of the Cordillera. Added to this natural wealth, there is a climate which is favorable to the breeding of a strong and manly race, such as can, and will, work for progress with an energy contrasting strikingly with the relaxing temperament to be found in the tropics. Besides, we know that it is easy to mitigate cold when it is impossible to escape the effects of excessive heat. Man is better built to face the low temperatures of the north than the debilitating fevers of the south. Those of us who, as engineers, have tried every variety of climate, can speak feelingly on this point, and there is no doubt in our minds that exploratory work in search for metallic wealth is attended with less risk to health above the Arctic Circle than under the equator. With the extension of the railroads, several of which are now projected, and the establishment of large depots for supplies and machinery, the vast region to which we have made reference will undoubtedly wake up out of its long night, and become infused with an industrial energy comparable to the unbroken day which marks one-half of the Arctic year.

⚒

ANTI-DEBRIS LEGISLATION IN CALIFORNIA.

The Anti-Debris Association is an organization composed of residents in the agricultural tract of California whose aim is to prevent the continuance of hydraulic mining in the foothill region, which drains into the Sacrameto and San Joaquin rivers. In the old days of hydraulic mining some damage was done to the river-lands by the debris or tailings, which accumulated in vast deposits at certain points. The Anti-Debris Association brought suit against certain prominent mines in the upper counties, and a long and bitter fight ensued, resulting in a victory for the valley men and a bad defeat for the hydraulic miners, whose mines were subsequently all closed down by injunction. A period of enforced idleness continued for some years, during which time many of the mining camps became almost entirely depopulated. The miners had to leave when the mines ceased working, and this affected the farming community also, as they lost a local market. Finally, through the efforts of the California Miners' Association, Congress passed the Cammineti law, which established a commission of Government engineers empowered to issue permits for the resumption of operations at the hydraulic mines, under such restrictions as would pervent debris from ever entering navigable streams or doing damage along the banks. Under this law the miners, when licensed, must build restraining dams, to hold back the debris until it settles in the impounding basins. Unless this is done to the satisfaction of the Government Commission the miner is prohibited from mining by the hydraulic process in the drainage basins of the Sacramento and San Joaquin rivers. Under this law several hundred hydraulic mines are now being operated, but their licenses may be revoked at any time by the commission, if they permit debris to escape into the streams or do any damage whatever; a great many small mines, however, remain closed down because the owners have not funds wherewith to build the necessary restraining barriers.

While, therefore, no indiscriminate hydraulic mining has been going on for over fifteen years, there were accumulations of debris from the former period remaining in the upper streams, and the Government and the State are building very costly barriers to prevent this coming down to the navigable portions of the rivers. The mines may not dump behind these barriers, but each must have its individual restraining dam at points selected by the engineers of the commission.

Notwithstanding the law giving the miners the privilege of working only under special permit and license, the Anti-Debris Association has recently become again active, and has brought injunction suits against hydraulic miners who have licenses from the Commission. The latest move of the Association is to pass resolutions to bring to the attention of Congress the alleged fact that the material being dredged by the Government in San Pablo Bay, a branch of San Francisco Bay, is all derived from hydraulic mines and that such mining should therefore be prohibited.

The dredging being done in San Pablo Bay by the Government is for the purpose of deepening the channel to enable the very deep draft battleships to go to Mare Island Navy Yard. Only a portion of the channel requires deepening, where bars have formed. A very large proportion of the drainage of the State of California is through the Sacramento and San Joaquin rivers, which empty into Suisun Bay, itself connected by Carquinez Straits with San Pablo Bay. Of course, sediment of all kinds is brought down by the rivers, the result of mining, plowing, etc., so the filling up is actually due to both the farmer and the miner; but as no hydraulic mining has been done for fifteen years in this district, whereby any tailings have gone into the rivers, and since the farmers plow every year, the miners do not like the blame of the shoaling of the bay to be laid entirely at their doors. Some of the material may be the result of mining fifty years ago, the silt having gradually come down to the estuaries. However, shoals having been formed, the Anti-Debris Association gravely decides to ask Congress "to take such steps as may be necessary to prevent the further filling up of the navigable waters of the State by hydraulic mining operations"; in other words, the Association wants to have the Government absolutely prohibit hydraulic mining, instead of letting it proceed as at present under the legal restrictions referred to. It is evident that the miners will soon have another fight on their hands. Nobody with authority has examined the material brought up by

the dredges to prove its derivation from the mines, but the Anti-Debris Association takes that for granted. Even if all of it is derived from mines, that fact would be no reason to stop hydraulic mining entirely, when already such mines are compelled to impound their debris, and have been doing it for ten years past. The miners will have to meet this contention of the anti-debris people and another contest is likely to be precipitated.

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MARKET CONDITIONS.

The metal markets continue rather quiet, and there are few changes to be reported since our last writing. The anomalous condition, of large consumption and small current demand, is not materially changed.

Copper is quiet and rather nominal. Manufacturers are apparently taking little interest in the market and business continues to be of rather small amount. On the other hand, producers are practically holding aloof almost as much as buyers, and no metal is being pressed for sale. Nominally, some of the large producers are holding their copper at a price above that of the current market, and are refusing to make sales below the figures which they have fixed. The present condition, however, cannot continue much longer, as many manufacturers will soon be getting rather short of supplies at the current rate of consumption.

Tin has been somewhat lower, under the influence of a decline in the London market. Business has been of moderate extent, however, and little has been done beyond present necessities.

The lead market is unchanged, with the usual steady demand. The floods in St. Louis and other parts of the West are, however, interfering very seriously with the deliveries, and it is impossible to guarantee the receipt of metal by Eastern consumers. It will probably take some time to straighten matters out.

Spelter continues very strong, and spot metal is exceedingly scarce. The same conditions prevail here as with lead, but to a greater degree, and deliveries are very uncertain. The Joplin ore market continues high. Reserves of ore are practically exhausted, and production is seriously delayed by the floods. The Western smelters are, accordingly, finding considerable difficulty in securing their supplies, and this condition tends to maintain the price of the metal.

Silver is quiet, with but little change. Eastern business is somewhat better, but the markets appear to be too well supplied to permit any considerable advance.

The iron trade shows little difference. The reduction of $1.50 a ton made by the Southern furnaces on foundry pig has stimulated inquiries somewhat, but it has also confirmed buyers in the belief that a further reduction may be had by holding off. This does not appear probable, however, and the chances are that in a short time buying for the last quarter of the year will spring up again. In the Central West, the pig iron market has been rather quiet, since the recent purchases of the United States Steel Corporation, and furnace capacity is now pretty well taken up to the end of the year. In finished material, quite a business has been done in bars and plates, but structural steel is still affected by the labor disturbance in the building trades. The most pressing demand, at the present time, is for girder rails, and other material for electric railroads.

The Western coal market is a little uneasy over the slower deliveries of Lake coal, and fears are expressed of delays on the railroads. The local markets, however, are quiet, and generally well supplied.

The Atlantic Seaboard bituminous coal trade is still quiet, though prices are a trifle better. Car supply continues to bother shippers. No serious labor troubles are threatened in the districts shipping to tidewater.

The anthracite trade shows no falling off in demand. The operators complain of mining being hampered by miners not working actively. Shipments, however, are heavy.

METALLICS.

Culled from all sources. Our readers are invited to assist this department by sending similar material.

It has been estimated that the nickel ore necessary for France's new minor coinage issue will be 4,600 tons, of 7 per cent ore, or about 322,000 kgs. of nickel.

A striking example of a rise in mining shares is afforded by the case of the Sierra Nevada Mine on the Comstock lode which, in 1882, rose during eight months from a price of 50c. per share to a maximum of $275—so that an investment of $1,000 would have brought $550,000 in less than one year.

An actual knowledge of the cost per unit of production, and of the elements which go to make up that cost, is the basis of economic success in mining, manufacturing, or, in fact, in any kind of productive business.

The use of metal tamping bars in mines has so often been proved to be dangerous that there is now no excuse for it.

There is no pure science which cannot be eventually applied to the welfare of mankind. The practical man should not despise theories which at first seem to be of *scientific interest* only; and the theorist should never forget that science is for man, not man for science.

To live is to progress, and to progress is to live. A science which does not progress, petrifies. Science advances in many different ways, along many different paths and by many different agencies.

By means of facts, correlating, discussing and deducing therefrom we arrive at a knowledge of the laws of the science, the rules governing its various phenomena and according to which its manifestations invariably proceed. Such deductions are the goal of pure science; they contain no element of speculation, hypothesis or theory and represent man's deepest insight into the phenomena of nature.

Recent investigations have shown that the salinity of the ocean varies greatly in different localities. The Atlantic has two large areas that are very salt, one north and one south of the equator, while the Pacific has one small salt area south of the equator.

Animal or mineral oils should never be used on, or allowed to come in contact with rubber belts, as they will eventually ruin the rubber.

It is stated that by the Mond Power Gas Process the consumption of *one pound* of fuel yields an energy output of *one indicated horse-power hour*, or about four times the power obtainable from it with ordinary steam engines.

One pound of bituminous coal oxidized with perfect efficiency is equivalent to 5.81 h.p.-hours.

Chlorine is sparingly soluble in a strong sodium chloride solution; such solution containing free chlorine is a fairly good solvent for silver, as well as for gold.

There is nothing more true in blast-furnace practice than the fact that it is easier to keep out of trouble than to get out of trouble.

In the iron foundry a little money spent systematically for the services of a metallurgical engineer (not a chemist) pure and simple, may save far greater sums. It is very much in the nature of an insurance against loss. Conditions may seem highly favorable for months at a time possibly; materials may be received of such uniform and satisfactory quality that money spent for expert services will appear to be wasted and therefore the plan discontinued. Then of a sudden there may be received shipments of coke or iron, which had they entered the cupola would have ruined at least one day's product before discovery, and the loss would have paid the salary of an expert for some time.

An iron metallurgist need not be a chemist, but he must know how to use a chemist and the results obtained by the chemist. The chemist is an absolute necessity to the metallurgist. The steel industry is the most marked example of an industry thriving under the care of expert metallurgists assisted by chemists. The two are rarely united in one person, each being busy in his own field.

The elements of an operating blast-furnace are for the most part variables, all of them influencing its working and the character of the iron produced. While it is possible to manipulate these variables so that a fair uniformity of results is obtained, there are certain combinations that occur frequently which compel a departure from uniformity, and make impossible an immediate return thereto. The chemical reactions that take place are progressive and continuous, and any condition that occurs to interrupt or modify the progression materially affects the ultimate result.

Of all of material charged into a furnace, the fuel has the greatest bearing not only upon the working of the furnace from a standpoint of tonnage, but also upon the chemical composition of the iron. While the ores are subject to variations that sometimes give rise to unusual conditions, it is not often that these variations cannot be met promptly in a way that will quickly restore the conditions to normal; variations in the fuel cannot be so promptly met and as a consequence have a more marked and lasting effect.

Mr. A. W. Walker, president of the American Foundrymen's Association, says: "The present situation in our trade—a powerful labor organization on one side, and no less powerful associations for defence on the other—is similar to that of the nations of the world, with respect to their naval armament. As strong navies are a guarantee to continued peace, so large and constantly increasing funds available for instant use by these strong organizations may insure industrial quiet. But great military and naval strength, while doubtless the most practicable peacemaker now, will in some period be obsolete for that purpose. As the increasing effectiveness of modern weapons makes war absurd unreasonable, and finally impossible, so large reserve funds may in time cease to be the chief reliance in dealing with labor."

The Brush storage battery patents, over which there has been so much litigation, expired on March 3, this year. The patents were fundamental in character; they covered nearly all useful forms of perforated, ribbed, grooved, or studded lead plates, as well as the mechanical application of active material or material to become active, to them.

DISCUSSION.

Readers are invited to use this department for the discussion of questions arising in technical practice or suggested by articles appearing in the ENGINEERING AND MINING JOURNAL.

THE SAMPLING AND ESTIMATING OF ORE IN A MINE.

The Editor:

Sir.—This excellent series of articles is without question the best presentation of the difficult and important subject of mine sampling, that has yet appeared; nevertheless, there are, I believe, a few points that have not been treated as fully as their importance demands, and some others where there is at least room for discussion as to the better practice. As Mr. Rickard says, "No two men set to work in exactly the same way." Each person naturally believes his own system the best or he would not follow it. Consequently, I propose briefly describing the methods that have in my experience given the best results in such cases.

Size of Sample.—The engineer having decided the proper distance between the points of sampling, it next becomes necessary to determine the safe weight of the original sample, taking fully into account the nature of the ground, and its breaking qualities. The sample is then estimated at so many pounds per foot in width of the vein. In gold and silver mines from 2 to 10 lb. should cover the limits in ordinary cases, and an average of, say, 5 lb. per foot will usually be found quite safe. Thus a vein 10 ft. wide would give a 50-lb. sample. This factor determined for the particular vein under consideration, the samplers should be instructed as to the width and depths of the sample cuts required, and as a check on the accuracy of their work, the samples should be weighed, and those exceeding 10 per cent variation from the adopted standard, rejected. The irregular weight of samples is a fruitful source of error in mine examination because the excess weight invariably comes from the softer and usually richer portion of the vein, or else it comes from loose or shattered rock containing, in its fissures, concentrated vein material not rightly belonging to a true sample. Large samples are usually a mistake in the systematic sampling of a gold or silver mine, and so we rely on "The smallest sample consistent with securing a true average of the lode at each place sampled."

Marking the Position of the Samples.—Where arbitrary distances are chosen for the points of sampling, the position of each cut should be marked off in advance and tied to cross-cuts, survey stations, and other prominent marks, so as to check up with the general plan of the mine. The position of each cut is best marked with a number, preferably the sample number, painted or chalked on the rock at one side of the workings; this facilitates re-sampling, or the examination of the cut, as one can walk directly to the point. It is a great advantage to the engineer to be able to examine the sample cuts while they are yet fresh, and, having with him the assay value of the ore, he will then quickly see from the nature of the mineral exposure those places that appear abnormally high or low and order the re-sampling accordingly.

Examining the places to be Sampled.—After the position of the proposed sample cuts is established as above explained, the vein at the places marked is carefully examined, brushed, or washed clear from accumulated dust, mud or dope, and irregular projections knocked off, so that the cut will be practically at right angles to the dip of the vein, or, at least, a straight line across the ore to be sampled.

In Fig. 1, the hard portions—A, B—should be removed before sampling.

Fig. 2 shows at once one of the most difficult samples to take, as well as the most fruitful source of error in mine sampling. I have usually seen in such cases the ordinary sampler make a cut around the back of the drift from A to B, say, 8 ft., whereas the vein would not be over 6 ft. wide, and so reported. To accurately sample such a section is well-nigh impossible, and so it is often advisable to shoot off the wings on the walls, preparatory to sampling.

Taking the Sample.—A moil and hammer are the best all-round tools for the sampler, though a heavy pick in medium ground will usually give a thoroughly even cut and hence a correct average. A box to catch the cuttings is perhaps as good and convenient as anything; it should not, however, be much, if any, wider than the cut, particularly in vuggy or porous ground, as the pounding may shake loose (and into a larger box) more or less fine, and possibly rich material, from outside the sample cut, and so salt the sample. Where this sort of thing is suspected, it is best to use one's hand to remove or catch the chips or rock as they are loosened by the moil.

Where two sets of samplers are employed, I invariably work them together, giving one the odd and the other the even numbers; this helps to eliminate the personal element, and tends towards uniformity of practice. It is also safer.

Checking the Sampling.—It is always expedient to re-sample a certain portion of the cuts, say, from 5 to 10 per cent, varying on the importance of the work. Where the examining engineer is depending on assistants to do the regular sampling, these check

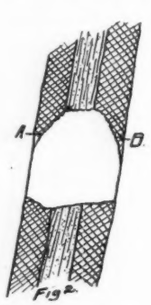


Fig. 2.

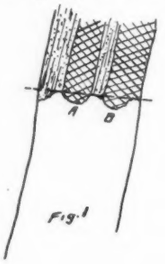


Fig. 1

samples should be his especial care. When samples cannot be assayed on the mine or in the immediate vicinity, the engineer is at a considerable disadvantage. In such cases he must, as a safeguard, take a large number of check samples, particularly of the more important cuts, say, not less than 20 per cent, otherwise he may have to pay a second visit to the property for the purpose of checking up some of the sampling, which from the look of the charts may not conform to other work and may, or may not, be correct. In most important mine examinations an assayer forms one of the party, and the samples are assayed on the ground, in such cases check samples should be taken immediately the work is started; these thoroughly test the whole process of sampling in the mine, the cutting down of the samples, and also the assaying. It is only such work as this, checking the original assay, that gives one confidence in the methods employed, and at the same time, serve as a perfect safeguard against salting.

When all possible precautions are taken, two samples, from the same cut across the vein, will seldom check with that exactness expected from original and duplicate samples taken by sampling machines from a lot of crushed ore. In a recent examination I decided to re-sample in the original cuts, two strips of poor ground occurring in shoots of pay ore. Here are the results:

Orig. sample.	Re-sample.	Orig. sample.	Re-sample.
$2.54	$3.54	$1.17	$1.39
2.80	1.50	1.57	1.39
2.71	2.57	1.24	1.84
2.18	3.35	1.68	1.50
1.98	1.35		
1.76	0.88	$1.41	$1.53 aver.
1.27	1.25		
1.26	1.87		
2.32	2.60		
$2.035	$2.10		

It will be noticed that while some of the assays run higher on re-sampling, others are lower, yet the averages of the nine originals and duplicates check to within 3 per cent. Thus it can be seen that averages cut quite a figure in mine sampling, hence many small samples are preferable to a few large ones. In another case, where the average values were running in the neighborhood of $240, one sample over 3 ft. wide assayed $1,258, a re-sample gave $1,208, and yet another $1,296, the average being $1,254, and the variations about 4 per cent from the original sample. I have another recent case in mind which will serve to illustrate more than one point: A line of check samples along a practically barren portion of the vein gave, as was expected, a series of very low assays, one, however, ran $25.41, and a re-sample was called for, the same man took both samples, but with the re-sample he sent this note, "Sample probably salted, cut a small vug and fine ore ran out into the sample box." It was salted, the assay of the re-sample ran $102.74. I then sampled the cut myself, and noticing a small seam of quartz containing some rich silver ore, I sampled that first, and the vein matter on either side afterwards, the result being as follows: 8 ins. of $151.60 ore; 1 ft. 3 ins. of $0.89 ore; 3 ft. 4 ins. of $4.47 ore; average, 5 ft. 3 ins. of $22.30 ore; practically confirming the original assay and showing that in certain cases the box as a means of catching the samples chipped off by the moil is, to say the least, misleading.

Sacking the Samples.—I prefer having the sample sacks plainly marked on the outside with a letter to designate the series, and a number, but not necessarily the number of the sample. One can then see at a glance and without opening the sacks, just what sample it is, and can give them to the assayer in any order one may choose; preferably, however, in serial numbers. The check samples, taken as the work proceeds, also receive a serial number, having, however, no relation to that of the original sample. The small samples are at once tied up in their sacks, placed in a large sack and taken along with the samplers as the work proceeds.

Cutting Down Samples.—Where nothing better is at hand, a board platform covered with a sheet of canvas, as described by Mr. Rickard, answers admirably. A small rock-breaker is, however, much preferable, and with it at least two sets of riffles and pans should be provided, to the end that the samples can be riffled down from the first, in a rapid, accurate and cleanly manner, and all coning, quartering, and brushing up from sheets or plates abolished and with them their many sources of error. All samples should be put up in duplicate, and in such manner that reliable assayers can determine their value to within 1 per cent. In order to accomplish this desirable end, the samples should be reduced to pass at least a 100-mesh sieve, and this work, be it remembered, rightly falls to the sampler and not to the assayer; the latter cannot be held responsible unless reliable samples are furnished him; furthermore, no careful engineer could afford to trust the ordinary assayer's helper, to cut down and reduce his samples. It is only when the samples are reduced to 100-mesh and put up in duplicate that the engineer is through with his part of the business. It is folly to divide samples of coarse ore and send them to rival assayers, and expect the work to check; like as not, both will be wrong. Where there are no facilities for bucking samples at the mine, and the engineer has not brought the necessary apparatus with him, samples can be reduced to say 20 or 30-mesh, the finer the better, put up in stout paper sacks, for shipment from the mine, and then ground and cut down in the office of the assayer in the presence of the engineer or his representative. Sampling is expensive. It must be done well to be of value, and in no stage of the proceedings is as much care necessary as in the final one of cutting down the samples. Work that is often relegated to the assayer's assistant, who, while competent for ordinary routine work, preparing specimen assays, etc., yet rarely has the training or ability to prepare samples for assay, in the manner that smelters and sampling works find necessary, and mining engineers should demand. The samples taken each day should, where possible, be reduced to the smallest limit before evening, put up in paper sacks and placed under lock.

Erratic Samples.—The proper treatment of erratic samples is always a difficult matter. Mr. Rickard has given both sides of the subject very careful handling and little more can be said. Where re-

sampling confirms the original high result, the inference is that the values are there, and it remains to make the proper disposition of them. When examining for an intending purchaser I usually, first reject the erratic, high samples if under 10 per cent and determine the average value of the remainder; next I insert the average value so found as the assumed value of the higher assays and estimate the block of ground on that basis, where erratic samples are numerous their relative importance to the whole number of the samples must be taken into account, as well as the amount of ground that they strictly represent, remembering that any given block of ground is not likely to maintain as high an average stoping value as that shown by sampling. When erratic samples run low and re-sampling confirms the result they must stand. The whole object of sampling being to establish the average value of the ore, it is well to remember that it is not an exact science, consequently, in computing results each man will, to some extent, be governed by his experience, in determining the factors to be used, so that his final estimates will conform to the actual production of any given block when stoped out. This is what we mostly strive for, and the engineer who is 25 per cent below the actual value in his estimates of "ore developed" is as culpable as he who is 25 per cent above.

In a former issue of this JOURNAL I attempted to describe a classification for ore reserves in different stages of development, and also for ore to be developed in the ordinary course of mining. These definitions have been discussed together with the articles on mine sampling, so I ask the same liberty of reply. "Ore in sight," I am pleased to note, has no defenders. Mr. George E. Collins appears to take exception to any method of classifying ore reserves, but gives an example of estimates made by his brother where the classification I suggested is very nearly followed. I further note that the distinguished engineer for whom Mr. Collins made this classified estimate, bringing to bear a wide and varied experience in such matters, unqualifiedly indorses my classification, using, however, the phrases "Positive Ore," "Probable Ore," and "Possible Ore" for those suggested by me.

Mr. Collins objects to my definition "Ore developed," exposed on four sides, because, forsooth, some such blocks have been found, in certain cases, "to enclose a large barren patch in the center," though why it should be in the center instead of any other part of the block, is not stated. Others have found a rich patch in the interior of a block, and can with equal propriety object on that account. These matters have nothing whatever to do with the proposed classification, they are taken care of in the factors the engineer employs in making his estimates of net values. It appears to me, that Mr. Collins does not quite understand the significance of my classification, the real point is not seen in the comparison of one vein with another, but in the various stages of development in one and the same vein. Where ore exposed on four sides can be more safely estimated, than ore hidden, say, on two or more sides, the former being a safer estimate is properly placed in a separate class.

The geological and other conditions necessary to be taken into account in estimating the production of a given block of ore, and applying the factors of correction, are so fully treated by Mr. Rickard and also by Mr. Purington, that it would be absurd for me to attempt to add another word.

Mr. Collins next calls attention to the expense of opening out a mine in blocks of 150 ft. by 300 ft.; his ideas are apparently connected with low-grade veins, and not over good mining. Taking the other extreme of values by way of contrast, I have seen winzes sunk that produced over $1,000 worth of ore per foot (in one case $1,500), and they were placed at less than 50 ft. apart. Between these extremes, the blocks that I suggested with winzes or raises at intervals of 300 ft., or of 200 ft., will, I believe, fairly conform to the best modern practice. The ore-body shown in Fig. 2, by Mr. Collins, is not typical of anything I have ever seen, and such is the opinion of others. That an ore deposit of that shape may occur is admitted, but that it is "typical of perhaps the largest number of ore-bodies in fissure veins" is denied.

A final word on my suggested system for the classification of ore reserves: We will assume the various blocks in a vein have been measured, sampled and carefully examined regarding their geological environment, and that the engineer finally decides that a factor of 10 per cent should be applied as a deduction from the values shown in the blocks exposed on four sides, then everything being equal, this factor of safety should be something like 15 per cent for blocks with one concealed side, 20 per cent where two sides are concealed, and something like 33 per cent where only one face of the ore is exposed. While on development these partially exposed ore blocks may equal, or even exceed, the averages found in the fully developed blocks, still the chances are that they will not, and a careful engineer will limit his risks in a manner something similar to the above factors, if indeed he will be willing to concede any estimate for ore exposed only on one face.

PHILIP ARGALL.

Denver, Colo., May 28, 1903.

ELECTRIC DRILLS.

The Editor:

Sir.—In No. 44 of the *Berg and Hutten-mannische Zeitung*, 1902, Mr. W. Mollmann, in a description of the Cripple Creek District, states that, besides other electric machines, electric drills are generally applied with *perfect satisfaction.* This seems to me a striking fact in comparison with the results of practice in Europe, Transvaal and Australia, where the air-drill, notwithstanding the lower efficiency of power transmission, maintains its prominent place. Perhaps one of your readers could supply some data covering *actual practice,* dealing especially with cost of repairs, rate of interest and redemption, labor and power-supply, expressed either in drive-footage per month, or hole-footage per month.

E. PINCKVOS.

Redjang. Lebong, Sumatra, April 20, 1903.

(The statement quoted from our esteemed German contemporary is not correct; but the Marvin and other electric drills have been extensively tried at Cripple Creek. We would be glad if one or two of our readers, cognizant of the facts, would contribute data on electric drilling practice. Mr. Winslow and Mr. Magenau have given valuable data. More are desirable, especially such as cover successful work, for, after all, it is the conditions favorable to success concerning which practical men want to know.—EDITOR.)

LABOR FOR SOUTH AFRICA.

The Editor:

Sir.—In view of the various difficulties which now exist with regard to the solution of the labor problem on the Rand, I hope you will allow me space for a few suggestions concerning a possibly available class of labor for that district. Undoubtedly, if it be possible to develop a mining population from the native blacks, every effort should be made toward the accomplishment of that object, and no other labor should be considered. From recent reports, however, it appears that the number of blacks available is likely to be insufficient for some time to come, and that the quality of the labor furnished by them is not all that could be desired.

As to foreign labor, numerous suggestions have been made, and attempts to import East Indians, Chinese and Italians have met with no great success so far.

While in charge of prospecting operations in European Russia, I employed Mohammedan Tatars from the Kazan Government, on the River Volga. These men received (figures in United States currency), from 25 to 40c. per day, according to the nature of their work, and varying ability. Out of this they bought their food, and as the work necessitated frequent moving about of camps, they lived in rude shelters of their own construction. They worked 10 hours, exclusive of one hour for the mid-day meal. At times 11-hour shifts were required of them, at which they made no demur. The Tatars are desperately poor in their own provinces, which are often famine-stricken, and every spring they cross the Urals on foot in great numbers, seeking work at the gold and platinum placers of the east slopes of the Ural. They walk distances varying from 300 to 600 miles. I have found them a very superior class of labor, and my experiences were confirmed by all reports of the platinum miners who employ them in preference to any other of the local labor. They are exceedingly apt to learn, are cleanly, temperate, hard-working and silent. Of Mongol stock, they are yet much superior to the Chinese coolie, as one sees him in the mines of California, and altogether more useful than the Indian coolies, who have been introduced into various British colonies.

While the Tatars can in no sense be considered a trained mining class for underground work, their quickness and aptitude for new work and conditions is surprising. They are generally healthy, and inured to great extremes of heat and cold. It is no uncommon thing in the Kazan government for the thermometer to register over 100° F. in the summer, and to descend to —35° F. in winter. The food of these men consists of mutton, eaten generally in the form of soup-meat, and large quantities of black bread, made of unbolted rye. They also drink much koumyss, or mares' milk, when obtainable, and are allowed about 1 gill of 40 per cent spirit (vodka) per day; a trifle more if called upon to work overtime. They are of mercurial temperament, and have little of that sullenness characteristic of many mining populations.

An anecdote related to me by a platinum miner will serve to illustrate some of the characteristics of the Tatars. A dredge on the River Tura had been injured to such an extent by the breaking up of the ice in the spring that the hull became leaky, and the dredge was sunk in 7 ft. of water. Preparations were made for raising it, and rafts were constructed and anchored in the river on either side of the sunken hull. It became necessary, in the preparatory work, to pass a number of cables under the hull of the dredge. After several ineffectual attempts, one of the Tatars voluntarily stripped off his clothes and dove into the water of the Tura, which at that time (April), must have had a temperature of 40° F. or less. The others followed his example and during the whole day, until the work of fixing the cables was completed, these men dove at intervals, staying under the cold water as long as possible.

In the open cuts of the platinum gravel mines, the Tatars frequently work on contract, in getting the gravel from the bank, and transporting it to the washing machines. In this case each man furnishes his own horse and cart, and makes often as high as $1.50 per day, which at the rate of living, is equivalent to from three to four times that amount of money in the Western United States. The wages paid to the Tatars on the platinum mines vary from 36 to 45c. per day, and men feed themselves. The hours of labor vary from 8 to 10 hours. Wages for Tatar labor in the Orenburg Government, or southern Ural, are much less, from 21 to 36c. per day.

As regards the transport of these men to the Rand in large numbers, there are many questions to be considered, but no insurmountable difficulty appears to present itself. Although the general attitude of the Russian Government is unfavorable to emigration of its subjects, it is not impossible that an arrangement could be entered into whereby the Tatars from the thickly settled centers along the Volga and the Caspian Sea would be granted permission to seek outside fields of labor, at least for a term of years. The over-abundance of labor in these provinces, and the frequent famines, causing destitution among the Tatars, make it the more likely that the Government would not stand in the way of such a movement. The Tatars, even of the poorest classes, far surpass the average European peasant in

intelligence, and were a properly constituted commission to go among them, setting forth the advantages of work in foreign fields, with the offer of, say, 40c. (80 kopeks, approximately) and keep, with transportation to the ground, there is little doubt that an army of laborers would be speedily enlisted. Should the first movement prove profitable for the Tatars, there is little doubt that thousands would follow. Although Mohammedans, the laboring class of Tatars are generally monogamists, from economic considerations, if nothing else. The transport of the wives and families of the men would be a necessity. The rye bread and other food which they have been accustomed to should be furnished them in the Rand, bakeries of the native character being established. On no account should the religion or customs of such a class be meddled with in their new environment. On the other hand, every effort should be made to allow them to retain their home conditions, and mosques of the primitive character, which one sees in the Tatar villages, should be built for them.

Owing to the fourth-class system of railroad transportation in Russia, the fare from Kazan, Samara, or other points along the Volga to Odessa should not exceed $5 per adult. From Odessa the Rand companies could control the rate of passage to Delagoa Bay by means of transport ships.

C. W. PURINGTON.

Denver, Colo., May 26, 1903.

FALLS OF ROCK FROM MOUNTAINS.

The Editor:

Sir.—A note in the "Metallics" of your issue of May 30 leads me to take advantage of your discussion department.

The statement is that on mountains such as the Matterhorn, the great falls of rock usually take place at night. In this I heartily concur, and the theory of explanation advanced is clear. I would like to add a mite to this as the result of my own observation.

During a year's residence in the jungle along the foothills of the Andes, at about 1° North Latitude, I noticed that apparently most of the rock falls occurred during the night. As the temperature is remarkably constant there however, seldom going under 65° or over 80° F. either night or day, the expansion of water must have had little to do with it. I always attributed the cause mainly to the heavy night rains, usually as regular as the sunset; next to slight earthquake disturbances, otherwise imperceptible, and lastly, to the fact that the jungle birds and insects quieted down for a period, rendering the occasional crash of cliff-rock or undermined tree more readily noticed than it would be during the hum of midday.

In a technical manuscript I recently observed the following statement, and would like to be enlightened as to whether there is any rational basis for such a positive assertion. Perhaps readers of the JOURNAL may be able to confirm or disprove it. It reads:

"In mines a singular coincidence occurs between the fall of roof-rocks and the time of day, such falls most frequently occurring between the hours of 11 and 1, either during the day or during the night; particularly those roof rocks which give a clear sound." This may be so; I'd like to know.

WILLIAM B. MCKINLAY.

New York, June 1, 1903.

GEOLOGY AND MINING.

The Editor:

Sir.—Your issue of May 23 is to hand, containing the views of "Mining Investor," which is a useful addition to the discussion as to the relative importance of the practical miner and the mining geologist in the matter of the discovery and the valuation of mines and their proper development.

The mining investor is a very important person, as it is he who keeps the industry alive. It is, therefore, desirable that he be put upon the right path in his endeavor to find good mines with as little risk as possible. It seems certain that the large number of mishaps in mining are due principally to the carelessness of the investor and his failure to have his properties fully examined by competent persons. Who is competent to do this work? It is the consensus of opinion among serious investors that the mining geologist, who is familiar with the workings and vein phenomena of a thousand different mines, in a large number of different districts, is more competent to pass judgment upon the value of a property than the practical miner who is familiar only with a few districts. They employ the geologist in all cases to examine well developed mines as well as prospects.

That this view is correct may best be illustrated by a few examples. A mine developed by a number of tunnels, cross-cuts and numerous workings showed large bodies of ore throughout all the workings and indicated plainly that the direction of the ore-shoot was to the east. The practical miner, who examined the mine for the investor, recommended its immediate purchase on the showing made by the workings. The investor, to be sure of his purchase, called in another man, a mining geologist, to corroborate the first man. The geologist, upon his first visit to the ground, saw at a glance, by the contour of the surface, that a possible faulting might interfere with the continuity of the vein. He examined the ground in detail and was enabled to demonstrate, from the outcrops of the rocks, that his surmise was correct, that a fault existed and that, as the result of a short survey, such fault would probably cut off the ore-bodies 10 ft. beyond the ends of the existing workings. Underground this evidence was corroborated by the fact that the ore in the breast of these workings showed a slight change of dip, which indicated the drag of the vein along the fault. His conclusions were that the ore in sight in the mine was nearly all the ore that could reasonably be expected to exist within the territory. Later developments proved that the geologist was correct.

Another case where the mining geologist was of more value than the practical miner, was a case where a vertical fissure, on a precipitous mountain, was developed by a long tunnel following the vein. The vein was large, but of low grade. The practical miner at once suggested the sinking of a winze to follow the ore, because the ore would improve in depth. The mining geologist, on the contrary, suggested a raise on the vein, because he had reason to know, although the surface was covered with deep wash, that a large stratum of limestone crossed the mountain at a higher elevation, and that the poor ore in the granite would probably change into better grade when the fissure cut through the limestone. In this case both raise and winze were made by the investor, and a "bonanza" was discovered in the body of the limestone.

These examples simply illustrate the necessity of geological knowledge. The mining geologist, in the course of numerous examinations, naturally becomes a miner of experience. The practical miner, on the contrary, rarely acquires either a sufficient knowledge of geology or the habit of observing the structural conditions which affect the mine.

I would advise "Mining Investor," in all cases, to employ a mining geologist of large and varied experience.

MAX BOEHMER.

Denver, Colo., June 1, 1903.

ERRATA.

In our issue of May 30, on page 817, the formula, in line 7 of the middle column, should read $K_2Zn(CN)_4 + Na_2S = ZnS + 2KCN + 2NaCn$, while in lines 14 and 15 the formulas should be

$$K_2Zn(CN)_4 + H_2S = ZnS + 2KCN + 2HCN$$

and

$$HCN + KOH = KCN + H_2O.$$

The article was on "Regeneration of Working Cyanide Solutions."

COAL EXPLORATIONS IN BELGIUM.—At present boring in the Belgian Campine is principally concentrated between Beeringen and the Meuse. Bores at Coursel, to the east of Beeringen are said to have given excellent result, while coal has been encountered at 80 m., and in another bore four seams of coal, 3.5 m. thick, have been passed through between 800 and 1,200 meters.

THE WHY AND THE WHEREFORE.*

BY JOSEPH W. RICHARDS.

As soon as facts accumulate and laws are discerned, the scientist inevitably begins to reflect on the why and the wherefore. He commences to search for relations, to imagine connections and dependencies, and to make pictures of the mechanism of the phenomena. It was thus that Dalton imagined the atomic theory to account for the fact of chemical combination in simple multiple proportions, that Arrhenius hit upon the dissociation theory to account for the increase of molecular conductivity with increasing dilution, that Nernst worked out the solution-pressure theory to explain the generation of current in the galvanic cell. Thus there are theories and theories, some poor, some good, and some almost perfect in their applicability, since, *granting their premises,* they give an explanation satisfactory to the mind, of all observed phenomena.

Such theories are not only allowable, but necessary. We must have them, much as an artisan must have a working drawing of the machine he will construct; the drawing is but paper and ink, which never moves or works, but it guides the workman in putting his ideas into realities. So theories help us to handle mental conceptions as if they were concrete things, and thus to imagine and discover relations and generalizations which would otherwise be beyond our mental grasp.

The danger to the development of a science comes when a theory, by being believed too implicitly and by not being open to constant revision, becomes a straight-jacket for the growing science. Like a "creed outworn," it stifles criticism, warps the judgment, engenders blindness and bias in its adherents and undue hostility and acrimony in its opposers. We should be slow in revising our theories, or in discrediting a theory which has done us good service in its day, just as we are conservative in correcting our "confessions of faith" or indulgent and sympathetic with the weaknesses of a faithful old servant; but, after all, when a theory has come to be considered so firmly fixed as to be above criticism, or so certainly true as to be above the possibility of revision, or so well-established as to thunder its excommunications on those who dare to think or believe otherwise—such a theory had better be placed at once in the museum of scientific petrifactions, where it properly belongs and where it can do no further harm.

If science is progressing, theories must progress too; they will be outgrown, much light will give way to more light, imperfect pictures of phenomena founded on crude assumptions must be replaced by better pictures corresponding more accurately to the newer and the larger truth, and then progress begins anew.

All theories have been of some use in their day; they have helped men to grasp concretely evanescent immaterial phenomena, they have very often been splendid guides to further experiment and new discoveries, they have at times been so helpful that many have mistakenly thought them infallible, and lastly, they have been stepping stones to better theories. One great hindrance to scientific progress is the common human weakness of becoming partisans of a theory. Who is not familiar with the well-meaning theorizer whose mental vision is so biased that he refuses or is incompetent to give a fair reception to new facts and theories; or who has not met the egotistical speculator who experiments and makes researches not to discover truth but to prove his pet theory? It might be thought that it makes no difference what the motive, so long as the work is performed, but it does make a world of difference. The biased investigator, with a theory to support, is

* Abstracted from presidential address, "Conditions of Progress in Electrochemistry," delivered by Prof. Joseph W. Richards, M.A., A.C., Ph.D., before the American Electrochemical Society, April 18, 1903.

apt to support it at all hazards, he catches at every straw which helps to establish his preconceived idea of what he should find, and is virtually blind to facts which disprove his ideas; while his report of his work, filtering through his perverted imagination, gives as often as not an entirely distorted picture of the facts. The scientific world, having to content itself with this report, shares to that extent the mental strabismus of the investigator. The pitfall is particularly dangerous to the young and ardent investigator. Believing almost implicitly in the rectitude and ability of his instructor, he takes to his professor's hobby with enthusiasm, and spurs it on to feats which make more careful scientists shudder. He rattles off glibly the shibboleth of the pet theory, talks of its hypotheses as if they were facts proved beyond all question, smiles superciliously at any one who questions the accuracy of his statements, and often gets irritated at the most friendly and unavoidable criticism. Thus the warmest friends of a theory are often its worst enemies, and by their blind partisanship lay obstacles in the path of scientific progress instead of being the leaders which they might be.

To make a specific application of these remarks, who has not felt that the most effective blows dealt the present theory of electrolytic dissociation have come from the excessive zeal of its warmest adherents. Out of their camp has proceeded half-fledged treatises on the theory, such as inaugural dissertations of would-be doctors of philosophy or text-books compiled by privat-docents, in which the theory was simply done to death and made a laughing stock. Have we not met writers or lecturers on this theory who shunned a fair debate on their written or spoken statements, because, forsooth, they were themselves conscious that they had surpassed the safe bounds of reasonableness in those statements? Such an attitude and such results are the consequence of holding a theory too tenaciously, and not "subject to revision." There are scientific zealots as well as religious bigots, and the one does as much harm to the progress of true science as the other does to the development of pure religion.

The fundamental conceptions of any and every theory must always be open to correction and revision, and thus progress will be rendered easy. If new facts appear which contradict our theories, let us welcome them, like loyal lovers of the truth should. The theory of electrolytic dissociation is being saved by being modified and revised, it is being transformed into a more perfect mirror of the truth as we now conceive it, and thus only is it retaining its usefulness and aiding in scientific progress.

METHODS AND VALUES ON THE YUKON.

By JOHN D. MCGILLIVRAY.

The richer gravels in the Klondike region have been worked out. Yet, practically speaking, the annual output remains rather steady, and it is claimed with very good reason that the output will not decrease, but probably increase, for many years to come. It is reported in press dispatches lately that the output for this year will be greater than the last. Judging from what I saw last fall in the way of preparation for this season's work I have no doubt that this is true. The reason for this is simply that the cost of working has been so reduced that gravel which formerly could not be worked at a profit is now yielding very good dividends. So, further, it may be said, that much of the gravel that is now condemned as valueless, will, within a very short time be in demand and held at high prices. In fact, it can easily be shown that under the costs that prevailed in the winter of 1897-8 hardly a claim in the Klondike country now being worked would pay a profit. Yet, as I say, the output of gold at the present time is larger than then, and, I may safely add, the profits are much greater. This is due to the improved methods of working and other causes for reduction of costs—mainly in transport.

BENCH WORKINGS, YUKON.
Level line of dumps marks bed-rock under bench-gravel.

During the winter of 1897-8 I made careful inquiry of the most intelligent mine owners on Eldorado and Bonanza creeks, as to expenses and output of gravel in cubic yards. This showed that, taking all expenses into consideration, on few claims was gravel thawed by wood fires, hoisted by hand windlasses from the drifts and washed in the spring for less than $15 per cubic yard. Wages at that time were $1.50 per hour, and freight from Dawson to the mines was from 10 to 20c. per pound.

Wages are now about 50c. per hour. Wagon roads have been built by the Canadian Government and freight rates are less than 1c. per pound from Dawson to the principal mining districts. The improvement in means of transport has been the cause of nearly all the reductions in the cost of supplies and wages. Then, in 1897-8, the royalty was 10 per cent on the gross output. Now a tax of 2½ per cent only is levied on all gold exported.

However, the improvements in the methods of mining and a better understanding of the local conditions have done more to reduce the cost of working and, consequently, to increase the areas of gravel that will pay to work.

Thawing ground by wood fires has been discarded and the use of steam has been substituted in most cases where drifting is being done. Steam was first used in the spring of 1899, and this was the first advance made in drifting frozen ground. An increase in the size of the steam plants and in the number of "points" and improvements in the methods of hoisting the gravel by machinery led to a large decrease in the cost of working by the drifting process.

The following figures show the cost of drifting on some bench claims—that is, the higher ancient river channels—on Bonanza Creek for the year ending October 10, 1902. This work is similar to the drifting which has been done for the last half century on the Forest Hill and other lava-capped divides in

VIEW OF DAWSON, YUKON TERRITORY.

OBSERVATIONS ON GOLD DEPOSITS.

BY CHESTER WELLS PURINGTON.

(*Continued from page* 855.)

Mr. Spurr, referring to the deposits of gold at Berezovsk[13] in Russia, says the veins generally stretch across the dikes at right angles to the walls and have been considered as filling fissures of contraction by Posepny.[14] This is probably correct, for the veins follow the same lines as the 'columnar jointing' of dikes, which are due to contraction.

This explanation of Posepny's regarding the veins at Berezovsk appears to me, with all due respect to the views held by that renowned student, as probably highly incorrect. The country rock at Berezovsk, which is situated 7 miles to the northeast of Ekaterinburg, Perm Government, Russia, is a part of a large area of granites and metamorphic schists occupying the south central part of the Perm Government. At Berezovsk itself the country consists of a muscovite granite in more or less schistose bands, intercalated with mica schist. In the immediate vicinity of the village is an unusually large area of pure granite, of fine texture, while the associated schist is subordinate in amount. The schistosity of the whole runs north and south. To the west, but within the crystalline area, are patches of a peculiar rock, which has frequently a curious green color, and which is probably a metamorphosed dolomitic limestone. This consists of magnesite, siderite and calcite, and is called listvenite. The richest gold ore which has been worked occurs close to Berezovsk The alternating bands of schist and granite have been at one time fractured by fissures having a direction N. 80° E., which, although they penetrate all the rocks except certain basic dikes, have their strongest manifestation in the granite. Into the fissures the gold-bearing solutions appear to have penetrated, resulting in the formation of the veins. In connection with the Berezovsk deposits occur bands of serpentine representing metamorphosed basic dikes. The quartz veins, which are rarely over 3 ins. in width, and from 6 ins. to 2 ft. apart, penetrate all the rocks except the bands of serpentine, and it is reasonable to infer that the basic dikes were the direct agents of mineralization.

In former times, when slave labor was employed, the Berezovsk deposit was developed by about 6,000 ft. of drifting and stoping, and I was enabled, through the courtesy of the present manager, Mr. Sokolof, to inspect these old workings. The mine is at present worked in places, but the low-grade ores formerly extracted cannot now be profitably handled. It is stated that the richest of the small veins carried 1 oz. in gold, while the average for the ore as mined was 0.25 oz. The average of the entire stock or wide belt of berezite,[15] as proved by recent sampling, is 0.1 oz. in gold per ton, and it has been determined that appreciable though not workable amounts of gold occur throughout the granite area for a width of several miles. The ore taken from the selected portions of the leads now being worked, is milled by stamps, thirty in number, with accompanying amalgamation, followed by Chilean mills, and the tailings directly cyanided.

The granite, called in its more mineralized portions, berezite, consists of quartz, feldspar and muscovite. It is impregnated with iron pyrite, and is subject to much local silicification. The examination of the granite by Arzruni, referred to by Mr. Spurr, is susceptible of more than one interpretation. The disappearance of feldspar can take place normally by sericitization, as shown by Mr. Lindgren[16], and as I have tried to show,[17] and in the berezite deposit subordinate silicification has evidently occurred.

I am inclined to disbelieve the efficacy of any tests which have been made on the Ural berezite, with the view of proving its primarily auriferous character. The difficulty of getting a piece of it which is not penetrated by one or more of the innumerable quartz stringers resulting from ore impregnation is great. The granite area itself is large, and the area of mineralization, so far as my observations have led me to believe, is very much larger. In a well sunk in the yard of Mr. W. E. Davidson in Ekaterinburg, decomposed greisen-like material was found, resulting from the disintegration of the schistose granite, on which the city of Ekaterinburg is built. I collected some of the material from the bottom of this well, and panned gold from it. I also panned gold from the decomposed material lying on the granite in the immediate outskirts of Ekaterinburg, and many little pits may be seen near the city, in the beds of the runs tributary to the river Isset, where the peasants have washed gold.

In the cuts of the Perm-Tiumen Railway, to the north of Ekaterinburg, exposures of the granite may be seen which appear fresh and unmineralized. But on close examination, pyrite crystals are generally visible, and quartz veins are not uncommon. Quartz veins and mineralized streaks, characterized by an oxidized appearance, may be seen penetrating the granite, close to the cathedral in the town of Ekaterinburg, in the public square situated between the telegraph office and the American Hotel. I give the above observations in order to indicate how widespread is the mineralization, and how nearly impossible it would be to obtain a piece of this granite remote from the proximity of a quartz vein.

As regards the fissuring at Berezovsk, there is much evidence to show that the fractures are not of

HYDRAULICKING ON BONANZA CREEK.

CLAIM NO. 3 BELOW HUNKER, YUKON.

[13] Berezovsk, pronounced Beryozoovsk, from the word Beryoza, birch tree.

[14] Posepny states that, although the fissures at Berezovsk cannot be ascribed to structural dislocation, nevertheless in the Pishminsk district (20 miles to the west), he found the gold quartz veins occupying the same position as in the peculiar Berezovsk granite, and suggests caution in referring the veins of Berezovsk to local filling from the granite. I did not see east and west veins in the Pishminsk District, but saw them at Moorzinsk, as noted farther on. (See F. Posepny, "The Genesis of Ore Deposits," *Transactions* American Institute of Mining Engineers, 1893, p. 70 of the pamphlet edition.

[15] Mr. A. Karpinski states, (*Compte Rendu*, Congres Geologique International, 7 me. Session, St. Peterbourg, 1897. p. ccix, that berezite, "in its typical form, consists of muscovite and of quartz with a mixture of pyrite; it is a rock of secondary origin, formed by the transformation of microgranite and of granite."

[16] W. Lindgren, "The Gold Quartz Veins of Nevada City and Grass Valley," 17th Annual Report United States Geological Survey, pt. 2, p. 148.

[17] C. W. Purington, "Preliminary Report on the Mining Industries of the Telluride Quadrangle, Colo.," 18th Annual Report United States Geological Survey, pt. iii, p. 807.

California, except that little timbering is required and no long adits.

Mining expenses, including board	$38,573.50
Mining stores	1,796.52
Fuel	5,957.00
Timbering—Labor and timber	2,355.34
Foreman's salaries with board	2,483.00
Management with board	3,464.96
General maintenance	2,819.70
October expenses	3,322.87
Total operating expenses	$60,772.89
Square yards worked	10,490
Cost, actual mining and sluicing, per sq. yd.	$5.79

Each square yard in this case is equal to about 1 1-3 cub. yds. This is a case of extravagance, of course. Many other mines in the neighborhood are being worked under similar conditions for considerably less per cubic yard; but it indicates how expensive is the average drift mining in the Yukon. And now I want to show that the time has come when the use of the steam shovel and dredges will take the place of all creek mining, and that all the higher bars and benches will be worked by the ordinary hydraulic method.

To begin with, let us take the same ground on Bonanza in respect of which I have just given the costs of drifting. The company owning that property purchased some water rights at a price of about $30,000. At first, having the water on its hands, a price of $80 for each 40 inches of water for 10 hours was charged to miners in the neighborhood. After a time the manager concluded that the water might be of value to the company, and so he began sluicing their own ground. This is the result of their first washing.

Total number cubic yards sluiced	29,000
Total number square yards bed rock cleaned	5,188
Gold recovered:	
Gross output	$35,978.10
Less. Bank charges	594.82
Mint charges	133.41
Export tax	781.95
Net bank returns	$34,467.92
Average value per cubic yard (gross)	$1.24
Average value per sq. yd. of bed rock (gross)	6.93
Costs:	
Installation of hydraulic plant, sluices etc.	$4,221.90
Operating (including cleaning bed rock)	5,960.11
Total cost	$10,182.01

The cost per cubic yard of operating, including cleaning of the bed rock was $0.205; the cost per cubic yard of operating, including cost of plant and cleaning bed rock, $0.35; cost of operating per square yard of bedrock, $1.148; cost of operating, including cost of plant, cleaning bedrock, etc., per square yard of bedrock, $1.96. The actual number of days (of 24 hours) hydraulicking, was 22; the quantity of water used (miners' inches), 200; the number of cubic yards sluiced per day of 24 hours, 1,318.18; the duty of miners' inch per day of 24 hours was 6.59; the average output per day (of 24 hours), $1,635.36.

The company's report goes on to say: "At least 80 per cent of the ground hydraulicked had been worked previously by the drifting process, so that the values obtained from these runs proves conclusively that the top gravels contain gold in paying quantities if they could be worked by the hydraulic process."

All I have said in regard to the Klondike country is true of the very much larger gravel mining country in Alaska from the international boundary line at the 141st parallel to Nome and beyond, northward, and to Valdes on the south.

In Alaska, at Forty-Mile and in the Birch Creek mines, much of the mining before the Klondike was opened was done in summer by shoveling up the gravel into sluice boxes. In most examples of this method, which I have observed, the gravel was shoveled up to a platform and then into the sluice boxes, and sometimes passed over two platforms.

Most of this lifting of gravel to the sluice boxes is now being done with steam.

In the summer of 1901 a steam dredge was put up on claim No. 46, below the discovery claim on Bonanza, by the representatives of a dredge manufacturing company in the States. It was worked during the summer, of course, and the manager explained to me at the end of the season that the results were sufficiently satisfactory to warrant his company in bringing in more dredges as soon as they could secure the necessary ground. Later they purchased creek claim No. 16 Eldorado, which is believed to have yielded as much as any other claim on that, the richest of all creeks in the Klondike region. No. 16 had been worked over by the drifting process in winter, and the gravel was washed in summer. No returns have been made of the output of this claim, which was 500 ft. long and about 400 ft. wide, but Government and other estimates make the output certainly over $1,000,000, and probably $1,500,000.

The price paid for this worked out claim was $75,000. The dredge people purchased other property in the neighborhood, which had been worked out by the drifting process. I may say here that No. 16 was more carefully worked than most of the Eldorado claims. The owners of three 500-ft. claims further up the creek on Eldorado informed me over a year ago that they were to work over again all their property with steam shovels or dredges. All this work will be done in summer time. It may be safely said that all of Eldorado Creek, which has been once worked over will be worked again with steam shovels or dredges. These facts speak for themselves, and further comment is hardly necessary to any one at all familiar with gravel mining.

Take the case of John Gregor in the Birch Creek diggings some 300 miles below Dawson and on the American side of the line in Alaska. Having made some money out of the richer claims on Mastodon Creek, Gregor acquired three miles of Mammoth Creek and located extensive water rights. Sampling, which seems to have been rather carefully done, showed an average value of $2.47 per cubic yard in shallow gravel not exceeding 12 ft. in depth. This was of no value if worked by shoveling into sluice boxes with wages at $8 or more per day, and other costs in proportion. However, last year Gregor took in a steam shovel with an estimated capacity of 2,000 cub. yds. daily. The freight on his plant was estimated at not less than six times its first cost. Even should the cost of handling the gravel be three times as much as it would be on the outside, this should leave a very good margin of profit.

There are, generally speaking, two descriptions of gravel along the Yukon, the old river channels, usually lying at considerable elevation above the beds of the present streams, and the recent gravels deposited by erosion of these ancient channels and from other sources into the beds of the present streams and adjacent bars.

Most of the gravel lying in the creek bed and on adjoining low bars is shallow, and has poor dumping facilities, and so affords better opportunities for the use of the steam shovel or the dredge than for the ordinary hydraulic methods with water under pressure. The costs of working with steam shovels or dredges should be assumed to be at least double what they are on the outside. The cost would vary considerably at different points along the Yukon on account of the differences in the cost of transport. Freight rates from the river up to the mines, distances of from 10 to 80 miles, are generally higher than from San Francisco or Seattle to St. Michael by sea, and thence up the river, something like 1,500 miles, to the nearest trading post.

In most of the districts along the Yukon there is a larger amount of bench gravels than of creek gravels. The bench gravels are being mined in the Klondike region on the Canadian side and in Alaska at Forty Mile, Seventy Mile, Koyukuk and Minook districts. These gravels are of uniform value, and, in most cases which I have examined, contain gold from near the surface down to bedrock.

Until last year not much effort had been made to hydraulic with water under pressure. In the Klondike country water in large quantity can only be obtained at very heavy expense, and, so far, capital, although offering to do this, has been prevented by the unfortunate regulations of the Canadian Government.

However, last summer there were three plants on Bonanza Creek and one on Hunker Creek working by the hydraulic method with water—from 60 to 100 inches in each case—pumped up to a height of about 250 ft. in order to give about 50 ft. of pressure. The same people and two or three other outfits have arranged to work this season.

In the Forty Mile, Seventy Mile, Birch Creek and Koyukuk districts, in Alaska, in most cases water may be obtained under pressure of 100 to 150 ft. with ditches, or part ditches and part flume, from 5 to 10 miles in length, and these gravels are in value about the same as those in the Klondike region. They are being worked in a small way, in spots, by miners without capital, and at an expense of from $3 to $10 per cubic yard by drifting or by shoveling into sluice boxes. Capital, by bringing in water in large quantities, can reduce these costs to even less than one-tenth what they now are. Estimates which I made on some large properties in the Seventy Mile country, where a ditch to carry 3,000 inches of water is now being built, showed that the cost of working should not exceed 10c. per cubic yard after the plant is installed, at a cost of less than $300,000. The company owns some 400 acres of gravel and can control at least 2,000 acres.

Over 50,000 acres of gravel have been located in the Klondike country, according to the returns of the Gold Commissioner, and as much in the Forty Mile and Seventy Mile country. During the past year a large amount of ground has been taken up in Alaska in large areas with a view to interesting capital.

As to values, I will say that in examinations made in Alaska and in the Klondike country I have found very little of the deeper bench gravel that would not yield more than $1 per cubic yard, and one large area of 110 acres, thoroughly and carefully sampled at an expense of over $10,000, showed more than $6 per cubic yard. The main advantages in Alaska, above those in the Klondike, are that large areas of gravel of high uniform value may be obtained with good dumping facilities, and that water from 1,000 to 5,000 inches may be brought on under pressure of 100 ft. or more with ditches from 5 to 10 miles in length, under more satisfactory mining regulations than those that prevail on the Canadian side.

This water may be used during the summer season for about 140 days, and, except in few cases, no trouble will be experienced with frost in the ground.

In conclusion, I would most particularly warn capital to carefully consider the question of transport in making any investment in this region. The cost of transport has made mining impossible in many cases.

MINING MACHINES IN SCOTLAND.—Coal cutting machines of the disk type have been introduced at the Dundonald colliery in Fife, compressed air being used as motive power. The output of the company has been increased from 50 to 300 tons a day.

TESTS OF INDIAN COAL.—Some experiments were recently carried out on the Indian State Railways with Cardiff and native steam coal. In each case a six-wheel coupled engine was put to haul 365 tons a distance of 110 miles, the terminal station being 315 ft. above the starting point. Two tests were made with Welsh coal, the time taken being 400 and 408 minutes, respectively; consumption of coal per train-mile 21.97 and 21.25 lb.; consumption of coal per gross ton-mile, 0.060 and 0.058 lb. For the other tests, three in number, Bird's Deshargarh coal was used, the total running time being 391.5, 405 and 398 minutes; consumption of coal per train-mile, 27.23, 28.13 and 27.19 lb., and consumption of coal per gross ton-mile, 0.074, 0.077 and 0.074 lb., respectively.

lowing facts observed by us, and deduced from testimony of miners and mine officials at the mines visited.

1. These mines are in all cases, either wholly or in part, naturally dry mines, and in no case did we find them wet enough to be considered safe.

2. In these mines so-called "windy shots" are sufficiently numerous and common to give warning that all conditions are favorable for disastrous dust explosions.

Dust explosions will not be prevented nor will the risk of such explosions be decreased, by the employment of shot-firers. Indeed, it may prove that the number of such explosions may be greater where shot-firers are employed, than where the miners are required to fire their own blasts. The object of your commission in recommending the employment of shot-firers is simply to limit the number of men in the mine, and thus lessen the loss of life at the time when dust explosions are likely to occur. We recognize, however, that the employment of shot-firers tends to remove the restraint which the responsibility of firing their own shots entails upon the ignorant, the thoughtless, or the reckless man; and that illegal and dangerous shots are more likely to be bored and loaded by such men when shot-firers are employed. We look upon the employment of shot-firers as a hazardous experiment which may well increase rather than diminish the loss of life, unless effective measures are taken to prevent absolutely the firing of illegal and dangerous shots.

In the opinion of your commission the lives of the shot-firers are in constant danger, and it is the manifest duty of the local miners' unions, through their mine committee, to put a stop to the drilling, loading and firing of dangerous shots, or dangerous combinations of shots, by every means in their power and thus protect as far as is possible the lives of the shot firers, who are the employees of the miners' unions and for whose safety the unions are responsible.

It will be to the interest of the operators for the protection of their property to instruct the mine officials to second the efforts of the miners' committees, and to see that the blasting act of 1899 is not violated by any of their employees, and to prosecute vigorously all offenders without fear or favor.

IRON MANUFACTURE IN SPAIN.—A report recently published shows that the iron and steel works of Spain used, in 1902, 456,535 tons of iron ore, and turned out 221,919 tons of pig iron. Of this, 10,130 tons were made with charcoal as fuel, the balance being made with coke. The steel production included 101,634 tons of bessemer and 45,740 tons of open-hearth steel. The two principal iron works in Spain are those of the Altos Hornos Company, and those of the Vizcaya Company. These two produced about four-fifths of all the iron and steel made in the country.

IRON PRODUCTION IN GERMANY.—The German Iron and Steel Union reports the total output of the German blast-furnaces in April at 824,452 metric tons of pig iron, which is 18,772 tons less than in March, but 132,904 tons more than in April, 1902. For the four months ending April 30 the output was as follows:

	1902. Tons.	%	1903. Tons.	%		Changes. Tons.
Foundry iron	528,633	20.3	582,993	18.3	I.	54,300
Forge pig } Steel pig }	403,140	15.4	258,313 / 290,913	8.1 / 9.1	I.	146,086
Bessemer pig	122,628	4.7	129,189	4.1	I.	6,561
Thomas pig	1,553,882	59.6	1,923,071	60.4	I.	369,189
Total	2,608,283	100.0	3,184,419	100.0	I.	576,136

The total increase shown this year was 22.1 per cent. The principal gain was in basic pig. Under the new classification, adopted by the Association at the beginning of this year, steel pig includes spiegeleisen, ferromanganese, ferrosilicon and all similar alloys; these were formerly put with forge and other irons.

THE COST OF LIVING AT JOHANNESBURG.

By T. Lane Carter.

Unfortunately the gold mines of the Transvaal are looked upon as a perfect Eldorado by mining men unacquainted with the prevailing conditions, and it is for the disillusion of such dreamers that this article is written. It is true that the salaries earned here are higher than in most parts of the world, but a high salary is not always a safe standard by which to measure net income. For instance, a man might earn a salary of $300 per month, but if the expenses of himself and family are greater, obviously he is not well off. Herewith I quote the pay received at the present time on the gold mines of the Witwatersrand; the figures represent a fair average: Manager, $680 per month; mine captain, $255; battery manager, $240; mechanical engineer, $240; surveyor, $155; electrician, $135; secretary, $230; shift boss, $165; miners and trammers, $105; machine drillmen, $160; carpenters, $125; assayers, $145; and laborers, in 1898, $80; in 1902, $55 per month.

It would be easy to find cases in which men represented in this list draw considerably more money than the average shown. For instance, one surveyor or one assayer might have charge of two adjacent mines, with a salary in some cases, of $250 per month. Or, on a small mine, one man might do both the assaying and surveying with an increased salary. In rare cases a manager might have control of two mines, in which case he would draw more money than given in the average list. Still these figures being the average for the Rand, are representative.

A casual glance down the above list would tempt one to declare that those connected with the mining industry in this country are exceptionally well off. But there is another side to the question. Take the case of a manager on $680 per month. I do not suppose there are many men in America in this position drawing so high a salary, but how much better off in many ways is the manager there. There are managers on the Rand with small families, who save very little out of their apparently high salary, on account of the expenses of their position. Of course, if the manager is an unmarried hermit, never going anywhere, nor receiving any visitors, then he can save money, but there are not many such cases. With the other members of the staff on a mine, the same thing is true. If they are married, with a small family, not very much can be saved out of the monthly stipend.

After careful investigation the committee of engineers who drew up a report, for Mr. Chamberlain, of the social and industrial conditions on the Rand, stated that the average cost of living (and, mind you, simple living at that) for a married couple, man, wife and three children, on a mine, was $122.40 per month. This figure will seem very high to those in other parts of the world, where living is so much cheaper, but the following table, showing the cost of food-stuff in England and the Transvaal, will help them to realize how this high figure is possible:

	In England.	In Transvaal.
Bread (4 lbs.)	$0.12	$0.36
Oatmeal (7 lbs.)	0.20	0.84
Flour (7 lbs.)	0.20	0.42
Tea (1 lb.)	0.36	0.48
Coffee (1 lb.)	0.24	0.48
Milk (1 qt.)	0.06	0.18
Butter (1 lb.)	0.24	0.48
Sugar (7 lbs.)	0.26	0.52
Salt (14 lbs.)	0.03	0.72
Eggs (1 doz.)	0.20	0.96
Bacon (1 lb.)	0.15	0.30
Cheese (1 lb.)	0.14	0.36
Jams (1 lb.)	0.08	0.24
Potatoes (14 lbs.)	0.14	0.84
Frozen meat (1 lb.)	0.12	0.24
Onions (7 lbs.)	0.22	0.84
Coal (100 lbs.)	0.24	0.36
Paraffin (1 gal.)	0.12	0.48
Candles (1 pocket)	0.09	0.18
Matches (½ gross)	0.12	0.72

Thus it is seen that the married man has little opportunity for saving money, if he is to live in anything like comfort.

The figures I give apply to people connected with the mines, where the officials are supplied with free houses, and the workmen rent houses for a moderate sum. In the town itself a married man is much worse off than the mine folk, and how some of them get on at all is a mystery to me.

This would be a doleful place indeed, were there not some men well off under prevailing conditions. For the unmarried man of a rare type this is probably the greatest Eldorado in the world. If he is frugal, hard working, sober and tenacious, the young worker on a Johannesburg mine has every chance of saving up a good sum of money. It is possible for him to save two-thirds of his earnings, if he "lays low" and stays at home. There are cases where the money saved up on the Rand has enabled young men to "set up" for life.

Unfortunately, young men of the frugal type are in the minority. Like most places, Johannesburg has a good share of young men who go in for "sowing wild oats." A more expensive city for this type of man could not be found. What is known as the "young society man," also has a hard time of it, for a young man's average salary will not carry him far into the social whirlpool.

Seeing the sober, frugal, unmarried man save money so successfully, many a married man has taken his example and sent his family off to England or Australia, where living is cheap, while he has remained here and saved money for a few years. It is very unfortunate for the future of the country for married men to pursue this course, but on account of the high rents and cost of living, many of them have, in the past, had no other alternative. No doubt the future will see considerable amelioration in the conditions of life, for the country can never go ahead as long as the population is a floating one.

I trust that this brief paper will show that the "high" salaries of the Transvaal are, to a great extent, high in name only, and that with the exception of one class of men, there are many other places in the world where a man is better off, though his salary be less than it would be here.

COAL MINING IN THE TRANSVAAL.

According to the report of the Transvaal State Mining Engineer for the half year ending December 31, 1902, the total coal shipped was 926,737 tons, the average price realized being $1.68 per ton at the mine. The total shipments compared with 471,275 tons in the first half of 1902, and 663,596 tons in the second half of 1901.

The average number of employees in and about the mines during the six months was 322 white men and 5,753 negroes, an increase of 110 white men and 1,162 negroes, over the first half of the year. The average wages paid to the negroes during the half year were $8.40 a month, but they received, of course, their food and shelter in addition to this payment.

There were 35 accidents reported during the half year which resulted in the death of one white man and 13 negroes, and injuries to 22 negroes.

The total number of linear feet of new shafts sunk in new mines, or extension of existing mines, was 535 ft., while 88,671 ft. of drifts, cross-cuts, etc., were made in the course of working.

THE LARGEST IRON-ORE CARGO.—Our special correspondent at Duluth reports that the biggest ore cargo yet carried was taken from Duluth by the steel ship *I. L. Elwood*, of the Pittsburg Steamship Company (United States Steel Corporation), last week. It consisted of 8,579 tons, and was taken on 18.5-ft. draft. The *Elwood* is one of four ships built for the American Steel and Wire Company before the formation of the Steel Corporation, and is 498 ft. long. The four are duplicates, and are the largest vessels afloat on the Lakes, but are to be beaten by a ship exactly 500 ft. long, that is now under contract for construction on the St. Clair River.

local development, and that the N. 80° E. fracturing, contemporaneous with another system which strikes N. 30° W., is of widespread areal[18] manifestation. In an open cut near the village of Berezovsk, the two sets of fissures, both sharply defined and carrying veins of auriferous quartz, may be seen. At other localities, from 5 to 75 miles distant, for example at the Moorzinsk concession, 5 miles to the north, at the emerald mines of the Crown Domain, 50 miles to the east, and in the Serebransk Dacha, 75 miles to the northwest, the fissuring, conformable in direction to that at Berezovsk is so well exemplified that there can remain no doubt of its being a general and not a local phenomenon. The data here given might be considerably extended, but the evidence I think is sufficiently strong to show that the directions of the veins at Berezovsk are determined by contemporaneous, widespread systems of fracturing, and it is justifiable to conclude that the provisional statement of Posepny regarding the origin of the fissures at Berezovsk is unworthy of consideration.

I have shown that at Berezovsk basic dikes occur which are themselves not penetrated by ore, but which have an influence on the values which are found in the veins of the granite and the schist. One cannot doubt that the granite must have been rigid to admit of fissuring. The basic dike intrusions occurred subsequently to the solidifying of the granite. The probability is that the ore-impregnation and filling were contemporaneous with, or directly consequent on, the intrusion of the dikes. The remarkable changes which have taken place in the bordering limestone, causing the change into listvenite, is another evidence of the widely manifested metamorphic action of the basic dikes. In short, the gold deposits in the vicinity of Berezovsk present nothing extraordinary. It appears to me an analogous occurrence to the Alaska-Treadwell Mine, on Douglass Island, Alaska.[19] There the mass or wide dike of sodium syenite has been mineralized throughout consequent on the intrusion of a much later dike of basalt. I have examined many microscopic slides of the Treadwell ore, both of the rich and poor varieties, and have failed to find one case in which minute stringers of quartz connected with pyrite crystals do not occur. The deposit exhibits all the features of a shattered, and subsequently cemented and impregnated mass. The Berezovsk deposit presents a near corollary to the Treadwell, the difference being that the dike rocks were considerably older at Berezovsk and the concentration of the gold values was considerably less. I have seen many of the openings on quartz veins in the Perm Government of Russia, and have reached the conclusion that so far as the gold deposits are concerned there has been a permeation, to an extraordinary areal extent, of gold-bearing solutions into a previously shattered and fissured country. The result has been, especially in the district of which the city of Ekaterinburg forms the approximate center, the formation, if it may be so expressed, of one great body of gold-bearing material, so low grade that it is not, except in certain very limited areas, of economic importance. The cause of this permeation is to be laid at the door of the basic dikes and stocks which occur in various parts of the region rather than to the rocks of granitic type which were earlier formed.

Taking the Ural as a whole, it is evident that the distribution of the gold deposits follows with a considerable degree of regularity that of the very basic rocks. At Miassky Zavod, on the Trans-Siberian Railway, in the Orenburg Government, where the gold deposits have proved exceptionally rich, as evidenced by the workings of many years, and where payable deposits are still operated, the region is characterized by a large area of granite with associated peridotite. Extending to the south, it is noticeable that the belt of peridotites, greenstone schists and porphyrites, making to the southwest, is characterized by the occurrence of gold as far as Verkhni-Uralsk, a distance of nearly 100 miles. On the other hand, the belt of more acid crystalline schists, and the granite area to the west, are for the most part singularly barren of gold values. The only exception in the granite area is Kotchkar,[20] where in the midst of an immense area of granite, extending in all directions, occur two small stocks of peridotite cutting through it. The more southerly of these, which is about two miles in length, is marked by the occurrence of gold deposits, in veins far richer than the veins of any of the surrounding area. It is the direct influence of the peridotites which has caused the auriferous values in the veins which now cut the enclosing granite. One has only to consult Sheet 139 of the Geological Map of European Russia, prepared by the Geological Committee of St. Petersburg (Vol. III, No. 2, 1886) to note the correlation of the iron-bearing rocks with the more prominent gold deposits. The occurrence of ilmenite, chromic iron, magnetite and other ultra-basic minerals at Miass, in the Ilmen Mountains, at Magnitnaia Stantsia, and other points in the gold belt, is not to be thrown out of consideration, when one is studying the association of the gold. At Miass I found it to be a well-proven rule of prospecting among the Kazak tributers or *"staratels,"* that there is a constant increase in the amount of placer gold, and presumably in the vein gold, from the granites and acid crystalline schists of the east toward the Igish mountains on the west, which are composed of greenstone schist, porphyrite, serpentine and peridotite.

On page 39 of his paper, Mr. Spurr says, "By applying the idea of the change of segregated metals with the progress of general rock-segregation, some light on mineral association and succession may possibly be obtained. For example, in many districts of the world gold and platinum are closely associated in places. In these districts it is usual to find extremely acid and extremely basic rocks (complementary varieties) intimately associated, representing apparently an extreme stage of rock-segregation; and frequently, as in the Urals, the platinum is found to be derived from the basic rocks (peridotites), and the gold chiefly from gold-quartz veins in the siliceous ones (granite). This is one of the simplest cases."

I have already tried to bring out the fact that the gold in the Ural is for the most part dependent for its occurrence on the distribution of the basic rocks, and I am not inclined to believe that the platiniferous areas of that part of Russia, where gold also occurs, offer any exception to the general phenomena which obtain. I agree with Mr. Spurr that the association of gold and platinum deposits, which he assumes to occur in the Ural, represents one of the simplest cases of allied rock and metallic segregation, but it is scarcely justifiable to dispose in an off-hand manner of a great area of metalliferous territory in which occur some of the most remarkable mineral associations which have been met with in the known world.

In the Goroblagodat region of the Ural, the most important deposits of platinum occur.[21] The gold associated with platinum in these deposits is derived from the same general rock area. This area includes the basins of the Iss and Viya rivers, tributaries of the Tura. The rocks in it consist of diorite, gabbro, peridotite, serpentine, porphyrite, syenite and limestone. There is no granite within the area drained by the Iss, so far as has been determined, and it will be noticed on Prof. Zaitseff's[22] map, which I have reproduced,[23] that the basic rocks are in larger proportion in the platiniferous areas of the two rivers. The gold occurs in the placers of the Iss in the proportion of from 1 to 25 per cent by weight to the platinum, while the ratio becomes more nearly equal as the distance from the source of the platinum increases. In the Tura, where the gravel is now worked by means of dredging, the proportion of gold to platinum is from 1-5 to 2-5 by weight. The source of the platinum has been determined to be in the rocks through which the Iss and Viya cut their beds, and it must be assumed that the source of the gold is in the same area. Prof. Zaitseff[24] in his detailed descriptions of the placers on the Viya River, in the vicinity of Mount Kachkanar, makes it clear that the proportion of gold is larger than in the Iss, and it is likely that this accounts for the larger amount of associated placer gold in the lower reaches of the Tura. As Mount Kachkanar is composed of peridotite entirely and as peridotite is the igneous rock in the vicinity far in excess of any other, it is reasonable to infer that the gold is more dependent on that rock than on any in the district. He refers to veins of quartz occurring in the region, and states that in many cases the gold and platinum exhibit little rounding, and could not have traveled far from the original source. In samples of the alluvial gold and platinum which I washed from the Tura[25] during the summer of 1902, there is no great difference in the amount of abrasion which the two metals have suffered. The platinum grains are rougher, as would be expected from the greater hardness. I would infer that the two metals are derived from sources not far apart.[26]

(To be continued.)

[18] Note the observations of Posepny before recorded.

[19] G. F. Becker, "The Gold Fields of Southern Alaska," 18th Annual Report United States Geological Survey, pt. iii, p. 64.

[20] H. B. C. Nitze and C. W. Purington, "The Kotchkar Gold Mines, Ural Mountains, Russia," *Transactions* American Institute Mining Engineers, vol. xxviii, 1898, p. 24.

[21] C. W. Purington, "The Platinum Deposits of the Tura River System, Ural Mountains, Russia," *Transactions*, American Institute Mining Engineers, vol. xxix, 1899, p. 3.

[22] "Die Plainlagerstatten am Ural," A. Zaitseff, Tomsk, 1898.

[23] C. W. Purington, *op. cit.*

[24] Zaitseff, *op. cit.*, p. 30.

[25] From the Yerosalinski Placer, 4 miles above the bridge where the post road to Bogoslovsk crosses the Tura.

[26] Owing to the impurities which are combined with the platinum its specific gravity, in its alluvial occurrence, may be reckoned as practically the same as that of the gold.

SHOT FIRERS IN INDIANA COAL MINES.

In the Terre Haute agreement made, in April, 1903, between the Indiana Coal Operators' Association and the United Mine Workers of America, District No. 11, it was provided that the question of employing shot-firers in certain mines should be submitted to a commission, to consist of one representive of the miners, one of the operators and an expert mining engineer. Under this clause, Mr. Wellington O'Connor was appointed to represent District No. 11 of the Mine-workers; Mr. Philip N. Penna was appointed on behalf of the Operators' Association; while Prof. Henry S. Munroe was selected as the third member of the commission. It is of some interest to note that Mr. Penna, who is secretary and treasurer of the Indiana Coal Operators' Association, was at one time president of the Indiana Miners' Union, later vice-president and finally president of the United Mine Workers of America. He was appointed to his present position some time ago. His varied experience, with both parties to the agreement, has placed him in a position to be of great service, both to the operators and to the miners' organization.

The commission, as above constituted, has presented a report which we give in full below. It will be of interest to compare this with the action of the Illinois mine operators, which was referred to the ENGINEERING AND MINING JOURNAL, May 16 last.

The undersigned commissioners, appointed under the terms of the Terre Haute agreement of April, 1903, beg to report as follows:

Your commissioners met at Terre Haute on May 25, and proceeded at once to the examination of certain mines selected by representatives of the parties to the agreement as typical "dangerous mines," Willow Grove and Brouillets No. 3, on coal VI; Oak Hill and Crown Hill on coal VII, all in Vermilion County; Rocky Run and Mecca No. 1 on coal III, in Parke County; Princeton on coal V, in Gibson County.

As the result of our examination we recommend that shot-firers be employed in these and in similar mines in the Clinton and Mecca districts with the single exception of Mecca No. 1, under the terms of the agreement. We base our decision on the fol-

TEST DRILLING ON THE MESABI IRON RANGE.

By Kirby Thomas.

At the present time more exploration work is being carried on upon the Mesabi Iron Range in Minnesota than at any previous period. In the effort to locate new ore-bodies, or to define the limits of those already known, about 250 drills, of all classes, are employed.

The Mesabi formation as mapped by Dr. Leith, of the United States Geological Survey, covers about 400 square miles, being a strip from 2 to 5 miles wide and over 100 miles long. The area in which the proved properties exist lies between ranges 14 and 25, a distance of about 60 miles. It is estimated that about 5 per cent of this total area is underlain with iron ore and about 8 per cent in the central section. In order to understand the problems and phases of the exploratory work now under way it is necessary to have in mind in a general way the nature of the deposit and some of the features of the formation. The Mesabi iron formation consists of a bedded series of siliceous rocks lying conformably on a quartzite. Above the iron member lies a slate formation, likewise conformable with it. The iron formation is from 200 to 2,000 ft. thick, and the whole series dips gently to the south and east at an angle varying from 5° to 20°, and averaging 8° to 10°. Glacial action and erosion have truncated the whole formation. Over it all lies a covering of glacial drift from a few feet to 100 ft. thick. The ore-bodies lie on the edges of the iron formation, and sometimes under the slate for short distances. They follow the flat dip of the rocks of the formation, and form broad, shallow deposits, in general having the shape of troughs. In nearly every case the deposit comes to the under-surface of the drift at some point, and generally the larger part of the body is covered only with drift. The ore frequently runs on the south edge in great wedges into and under the "taconite," as the iron formation is locally called, and sometimes extends under the edge of the overlying slate. This latter phase of the deposits has resulted in greatly extending the ore-bearing areas, as it was formerly assumed that the ore did not lie under any considerable thickness of taconite.

The earlier explorations were conducted entirely by test-pitting, and the district was pitted with shallow holes in the drift reaching to the ore, or taconite, or slate, as the case might be. In one or two instances well-drilling rigs were used to reach the formation. The necessity of deeper boring and more extensive explorations soon led to the adoption of the churn and the diamond drill, and to-day this is the chief method of exploration. Indeed, test-pits are seldom dug now, except for water, and where the conditions for digging are particularly favorable; and then they are only sunk through the gravel.

The churn drill used is a development of the Mesabi. It consists of a chisel drill on an extensible hollow rod. This rod is attached by a flexible coupling to a pump which forces a stream of water into the hole and out of perforations near the attachment to the bit. This water returns inside the casing, which is an ordinary gas pipe, 3 ins. in diameter when in surface material, and 2 ins. in rock and ore. The drill is manipulated by a rope passing several times over a drum driven by a 6 or 8-h.p. oscillating engine, and the "jerk" is given by a man tightening or slacking the rope coil. The drill is rotated by hand, the driller standing on a platform built in the tripod. When boulders are encountered they are blasted out with dynamite. This churn drill is manufactured in Duluth, Minn., and seems to do the work. A churn drill outfit, boiler and all, costs $1,000 to $2,000.

When taconite or hard slate is struck it is necessary to use a diamond drill. Several different styles of diamond drills are used; nearly all of those in use in the field to-day are either Sullivan or Bullock make. An "E" bit is used, which gives a hole 1 9-16 ins., and a core 15-16 in. The diamond drill is used in conjunction with a churn drill. When the diamond drill passes through the taconite into ore, it is customary to blast out the hole and force the casing down, and resume the drilling in the ore with a churn drill. This blasting is done by suspending in the hole two or three sticks of dynamite, or sometimes 10 or 15, and firing them with a battery. The casing, which had been partly pulled out, is then forced down with a drive weight, and the churn drill inside chops out the hole until the casing can follow to the bottom of the hole.

The diamond drill outfit varies in cost from $2,500 to $4,000. As the drilling is generally shallow—from 150 to 300 ft.—a very moderate outfit will do the work. Four to six carbons are used on the diamond bit. These are set daily, and if properly used and well selected, will last sometimes two years

"Carbons," as the black diamonds are called, cost $45 to $60 a carat. The price now is $50. From 12 to 16 carats are used on a bit. Carbons vary greatly in durability. They are usually bought on the judgment of the operator, a dense and close grained stone being preferred. One leading drill man gives the carbons a specific gravity test before selecting. It occurs to the writer that a modification of the method of determining specific gravity by a heavy solution could be used to advantage in the selecting of carbons.

A CHURN DRILL ON THE MESABI.

The work is not particularly hard, and there is little trouble from broken formation resulting in crooked holes and lost bits. A carbon is occasionally lost from the setting, but is usually found in the choppings.

A churn drill will make from 10 to 20 ft. a day. A diamond drill will average 5 ft. in fairly hard formation. Three men are employed on each drill. The wages paid are $3 for drill runners and $2.25 for helpers. The foreman gets $100 a month and has charge of several outfits. Diamond setters get from $90 to $125 a month. Wood and coal are used for boiler fuel, as may be most convenient. Wood is plenty in most of the localities. Water is generally easily obtained, but in the summer it is sometimes necessary to haul water, and it takes one team to keep a drill outfit supplied. Very few of the drills are mounted on wheels, as it is easier to transport them from place to place on skids. The country is rough and much of it swampy.

The drill-holes are usually assayed every 5 or 10 ft. In the Eveleth District an assay is made every 3 ft. The Steel Corporation has assays made every 5 ft. The ore, or choppings, forced up the casing by the water jet, is caught in settling tubs or sluice boxes. It is sluiced through three boxes or tubs and allowed to settle. The settlings are dried and thoroughly mixed, then sampled for assay. This method gives some errors in results as the siliceous content seems to flour and float away. The practice is to add to the silica content shown by assay, 10 per cent of itself to allow for this discrepancy. A test of an ore mixture, to determine the error in sampling from the settling sluices, showed before treating with water and settling 59.23 per cent iron and 0.087 per cent phosphous; after settling 20 minutes 60.80 per cent iron and 0.094 per cent phosphorous; and after settling 16 hours 59.67 per cent iron and

0.088 per cent phosphorus. This assay of the drill cores is of importance, as it determines often the grade of the ore, and is used as a basis for the mining operations. The cargo analyses are checked up against these drill tests.

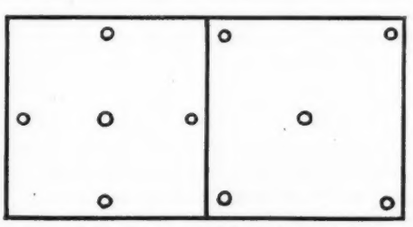
The cores come up from 2 ft. to 0.25 in. in length. In iron ore the churn drill is used and only choppings result. A sample of the cores is taken every 5 or 10 ft., and sent to the head office or retained by the operator.

The surface indications of iron are meager and not very reliable. Some of the explorations have taken into account the topographical features of the district, and the theoretical geological conditions, but generally a tract located on or in the vicinity of the ranges is selected and drilled without regard to indications on the surface. The unit of explorations is 40 acres, and this is called locally a "forty." The Federal mining laws do not apply here, so the property is included in the vertical boundaries of the tract. The usual test for a 40-acre tract is to put five holes—one in the center and four 300-ft. toward the center from each corner. Where two forties are drilled by the same parties the holes are arranged as shown in the diagram herewith, thus minimizing the chances of missing the ore-body. However, drilling five holes is not considered a final test. In the Hibbing District there is one case, where the regulation five holes would have missed altogether a small ore-body of about 1,000,000 tons.

In proving up an ore-body or testing completely, the practice is to divide the property into squares of 300 ft., each commencing 100 ft. inside of the 40 line, and drilling on the intersections. The practice of the Steel Corporation is to ignore the survey lines, which are very irregular; to tie the tract to some surveyed property and lay it off in squares of 100 ft. each. Drill holes are then sunk on each second or third intersection, according to the purposes of the test and the intersections are taken alternately so as to leave the smallest possible radius of undrilled land.

Sometimes, in drilling for development, it is necessary to put holes in at closer intervals. This is the case especially where the work is along the edge of an irregular deposit. The ore-bodies do not always taper out. One instance of the need of closer drilling is related by one of the operators. The 40 drilled showed 150 ft. of ore up to 25 ft. of the line. The adjoining 40 was considered good; in fact, it was counted as reserve. But on drilling it showed that on going 50 ft. on the unexplored 40 the ore was only 25 ft. thick, and in another 50 ft. it had run out. It is said that the first operators on the famous Mahoning tract missed the 150 ft. ore-body by 50 ft. and threw up the option.

A DIAMOND-DRILL IN THE MESABI.



DRILLING ADJOINING FORTIES.

Most of the drilling is done by contract, one contractor, Mr. E. J. Longyear, having 110 drills in operation. Daily reports of the work are made to the contractor, and frequent reports to the parties interested. When a piece of property has been drilled, the result is platted and a blue-print made of the location of the holes and the results. These reports are signed and dated and are considered reliable data as to a property. The contractors are well known and responsible, and there is no instance of a misleading or false report being made. The cost of drilling is from $3 to $3.50 per foot for churn drills and from $5 to $6 per foot for diamond drills. In some cases the diamond drill work costs more. In one case, where the Great Northern Railway was working off the formation, the cost was $10 a foot. The cost of test-pitting is $1.60 to $2 a foot with 10c. increase for each 10 ft. after the first 20 ft.

The drill-holes vary much in depth in different districts. Near Hibbing one hole is over 350 ft. in ore. The rule is when ore is found to go through it. There is no definite rule as to when the bottom is struck. If quartzite is found, this is taken as final, but most of the ore-bodies are bottomed in taconite and sometimes the drill will go through a bed of ore into a taconite layer and then again into ore. It is generally believed that much ore exists below the present bottoms. The old rule was to stop when taconite was found, but some of the best ore-bodies are now found to lie below the taconite. Usually these are the extensions of ore-bodies which outcrop to the north. In one case the drill went 152 ft. in taconite and then struck 100 ft. of ore. There are several cases of ore under from 50 to 100 ft. of taconite. In fact, in some parts of the range, the finding of taconite under the surface drift is considered a sure indication of an ore-body beneath. When the drilling is too far south the slate is struck. In rare cases, ore is found beneath the slate, but ordinarily the hole is abandoned when slate is struck. The deepest hole on the range is in Section 34, Township 59, North Range 14, where Mr. E. J. Longyear drilled from the Virginia slate through the iron formation into the greenstone and found the iron fromation to have a thickness of 576 ft. A depth of 300 ft. from the surface, however, would include most of the known ore-bodies.

In some of the mines jumper drills worked by man power are used to test the ore or to do surface work. The Mahoning mine sunk a number of man-holes in the ore-body to determine the character and grade in advance of mining.

Steel ball drills are to be tried on the range this summer, as well as various cutting devices, but the operators seem to be satisfied with the present equipment for the work.

The Steel Corporation's engineers have reduced the testing by drilling to a science. When a property is to be stripped it is thoroughly drilled to locate any horses, or barren places, and to estimate the amount of gravel to be removed. In advance of mining, systematic drilling is done, and a careful record of the holes, with analyses of the ore, is on the mining captain's desk when the work is being planned. Mines are bought and sold on the drill test. A long ton is computed to occupy 11.5 to 14. or even 17 to 18 cub. ft., according to the texture of the ore.

The net result of the present season's drilling cannot be foretold. Almost daily new ore-bodies are located or old ones expanded. The drill has come to be a fixture in the mining economy of the Mesabi, and the results of its use are most satisfactory.

At present the most active drilling is being done in the vicinity of Hibbing; but the whole south edge of the range is under test and the eastern and western ends, particularly the latter, are being actively prospected.

THE ANNUAL REPORT OF THE MINISTER OF MINES OF BRITISH COLUMBIA FOR 1902.

BY OUR SPECIAL CORRESPONDENT.

The annual report of the Minister of Mines of British Columbia for the year ended December 31, 1902, notwithstanding that it was dated March 11, was not presented to the Provincial Legislature until nearly the end of May. The delay in its issue, although shorter than that of last year, was an unreasonably long one, particularly under the circumstances that no estimate by the Provincial Mineralogist of the mineral production of the Province for the previous year was published last January, as was done in January, 1902. The delay is in part attributed to the difficulty in obtaining statistical returns from a few of the mines, some 10 per cent having failed to make returns promptly, thereby keeping back all the statistical tables. As, however, there is a statute under which penalties are provided for such neglect, there is no need to continue to permit a few dilatory ore-producers to stand in the way of valuable information and statistics relative to one of the most important industries of the Province being made readily accessible to the public before its value and unsefulness shall have become in some measure impaired. Apart from this, though, it would appear that the Minister of Mines is himself responsible for a delay of nearly three months.

Looking at the statistics of production during 1902 by themselves it would appear that no advance was made in the Province by the mining industry during the year under notice, the total value of the minerals produced having been but $17,486,550, as compared with $20,086,780 for 1901, as shown in the following table:

	1901. Quantity.	1901. Value.	1902. Quantity.	1902. Value.
Gold, placer	48,505 oz.	$970,100	53,657 oz.	$1,073,140
Gold, lode	210,384 oz.	4,348,603	236,491 oz.	4,888,289
Silver	5,151,333 oz.	2,884,745	3,917,917 oz.	1,941,328
Copper	27,603,746 lb.	4,446,963	29,636,057 lb.	3,446,673
Lead	51,582,906 lb.	2,002,733	22,536,381 lb.	824,832
Coal	1,460,331 long tons	4,380,993	1,397,394 long tons	4,192,182
Coke	127,081 long tons	635,405	128,015 long tons	640,075
Other materials	.....	417,238	.....	480,051
		$20,086,780		$17,486,550

This falling off in total value is disappointing when compared with the distinct advance made in each of several previous years since 1898, as under:

B. C. Mines Report.

	Value.
Total production in 1898	$10,906,861
Total production in 1899	12,393,131
Total production in 1900	16,344,751
Total production in 1901	20,086,780
Total production in 1902	17,486,550

The decrease in total value of last year's production is largely due, the report states, to the lower market values of the various metals. The tonnage of ore mined was, however, greater, and in this connection the following table may be found of interest, for purposes of comparison:

	1898.	1899.	1900.	1901.	1902.
Gold, placer, oz.	32,167	67,425	63,936	48,505	53,657
Gold, lode, oz.	110,061	138,315	167,153	210,384	236,491
Silver, oz.	4,292,401	2,939,413	3,958,175	5,151,333	3,917,917
Copper, lb.	7,271,678	7,722,591	9,997,080	27,603,746	29,636,057
Lead, lb.	31,693,559	21,862,436	63,358,621	51,582,906	22,536,381
Coal, lg. t'ns.	1,135,865	1,306,324	1,439,595	1,460,331	1,397,394
Coke, lg. t'ns.	35,000	34,251	85,149	127,081	128,015

It will be seen that in both placer and lode gold, in copper, and in coke, there was last year an increase in the quantity produced, and that the decrease in coal was comparatively small. There was, though, a large decrease in the production of silver, and a still larger shortage in lead. To this decrease in quantity together with the considerable shrinkage in average values for the year is directly traceable the seeming retrograde movement in the mining industry of the Province.

The comments of the Provincial Mineralogist on the situation assign reasons for this check in progress, believed to be but temporary. He observes, in part: "The progress made by the Mining Industry of the Province has, during the year 1902, been less marked than usual. If the statistics of production alone are considered it would appear that no advance has been made, as the gross value of the mineral production for 1902 is less than that of the preceding year, the first time that such a thing has happened since lode mining became an industry in the Province. While it is necessary to face this fact, it is also necessary to learn to what causes the fact is attributable, whether such causes are permanent or temporary, and whether they are removable or not. The diminished production is not due to any failure in the mines themselves, for no widespread failure has occurred, and as a matter of fact the mines are in a better condition than they were a year ago. The adverse conditions affecting the output appear to have been different in the various branches of the industry, but, as is the way with misfortunes, they came not singly.

"The placer mines showed in 1902 an increased production over the previous year of about 10.5 per cent. This is an exceedingly good showing, but is not nearly as good as it would have been had not the rainfall for the year been exceptionally light, causing a shortage of water supply, which sadly diminished the output of the hydraulic mining companies. This shortage of water is, however, only a temporary trouble, and should disappear with another year.

"In the coal mining branch of the industry, the Coast collieries have had their principal market, California, invaded by fuel oil produced in that State itself, and yet, although this competition has come upon them suddenly, they have been able to dispose of within 8 per cent as much coal as last year, and a greater amount than in any year previous to 1901. The Crow's Nest collieries had an unlimited market open to them, but were met with, first an explosion which crippled their principal mine, followed by strikes which diminished the output, causing the production for the year to be only about half what it should have been, and undoubtedly will be next year. Despite all this, the coal industry about holds its own, but, like the 'placer,' did not make that advance which the conditions of the mines and market would have justified.

"The lode mining of the Province has been the branch most sorely beset, and this not owing to any failure of the mines themselves, but to the unprecedently low market price of metals which has prevailed during the entire year, beginning, as it did, in the last month of 1901, while it is only in the early months of 1903 that the market has begun to recover."

Summarizing some of the remaining information contained in the report the following is obtained:

The tonnage of ore mined in the Province was greater, amounting to 998,999 tons, as against 920,416 tons mined in 1901, an increase of 8.6 per cent. This great increase is entirely due to Rossland and the Boundary, more particularly the latter district, in which 521,402 tons of ore were mined and smelted.

The number of mines that shipped ore during the year was 124, and these together employed 3,345 men, 1,126 above ground and 2,219 below. The statistics of the non-producing mines are very incomplete, only 44, employing a total number of 342 men, having reported to the Mines Department.

The gross output of coal during the year was 1,641,626 tons, of which 244,232 tons were converted into coke, leaving a net output of 1,397,394 tons of coal and 128,015 tons of coke. The net output of the Vancouver Island collieries was 1,173,893 tons of coal, and 20,178 tons of coke, and that of the Crow's Nest Pass collieries 223,501 tons of coal and 107,837 tons of coke. Of last year's total production 775,300 tons of coal and 38,780 tons of coke were exported to the United States. The recently-made addition of transportation facilities giving direct railway communication between the Crow's Nest Pass coal mines and the United States, and the removal of the United States import duty of 67c. per ton, together promise the probability of the exports during 1903 being much larger than last year.

The combined placer and lode gold output for the year, as usual, maintained an increase, having reached a total value of $5,961,409, the highest gold output ever made by the Province, and an increase over that of 1901 of $642,706, or about 12 per cent. The greater part of the placer gold came from the Cariboo and Quesnel divisions of the Cariboo District, and the Atlin Division of the Cassiar District. Hydraulicking was not successful on the whole last year, a shortage of water having been the chief preventing cause. There was not so much dredging for gold done as in some earlier years. Lode gold mining, with a production of $4,888,269, showed an increase over 1901 of about 12.5 per cent, this coming chiefly from the gold-copper mines of the Rossland and Boundary districts. The product of lode gold mining in British Columbia has shown the steadiest and most regular increase, and this is the most valuable mineral product the Province has. It cannot, however, be classed as even a separate branch of the mining industry, inasmuch as here the gold is found mostly in combination with other metals, such as copper or silver. A certain amount of this production is derived from stamp milling, etc. but it is obtained chiefly by smelting. The following shows approximately that the gold has been derived from: Direct smelting of copper-gold ores, $4,232,948; combined amalgamation and concentration, $655,321; total, $4,888,269.

The total amount of silver produced was 3,917,917 oz., valued at $1,941,328, a considerable decrease as compared with 1901, but practically the same output in quantity as that of 1900. Of this total amount about 25 per cent was mined in association with copper, while the remaining 75 per cent was mainly derived from the silver-lead ores of the Slocan District and of East Kootenay.

The lead production was 22,536,381 lb., or only about half that of 1901, owing to the suspension of the East Kootenay lead mines. The production was, nevertheless, greater than that of 1899.

The output of copper was 29,636,057 lb., an increase of 2,032,311 lb., or 7.4 per cent over that of the preceding year; but owing to the reduced market price of this metal the value of the year's output was $1,000,290 less than was that of 1901. The Boundary yielded the greater part of the copper production, with an output of more than half a million tons of ore, while Rossland made the next largest output. The following shows the districts from which the copper output of 1902 was obtained: Boundary, 14,955,582 lb.; Rossland, 11,667,807; Coast, 2,496,681; Nelson, 491,144; other districts, 24,843; total, 29,636,057 lb.

A good deal of iron ore was mined on the Coast during the year but the only shipments made were from Texada Island, from which some 6,290 tons of magnetic iron ore, running more than 50 per cent iron, were sent to the iron furnace at Irondale, Washington, U. S. A. From the iron mines at Cherry Creek, near Kamloops, 3,727 tons of magnetite were shipped to Nelson, for use there in the smelter as a flux. Included in the report is a lengthy special article on "The Iron Ores of the Coast."

In reviewing the general development of the year satisfaction is expressed at the advancement made in several districts. Good progress was reported from the Atlin, where 600 to 700 men were employed in gold placer mining and hydraulicking during the summer and about half that number in the winter. The copper properties on Texada Island made a good showing, while others on Quatsino Sound,

West Coast of Vancouver Island, commenced to ship ore; in the Rossland (Trail Creek) District the tonnage of ore shipped was 329,534 tons, an increase of 46,174 tons over the output of 1901, the Le Roi and Le Roi No. 2 mines having contributed most of this increase. The Boundary District, more than any other part of the Province, attracted general notice, the immense size of its low-grade ore-bodies having been generally recognized, and the practicability of working them at a profit having been demonstrated, even with copper at low prices.

The work of the Provincial Bureau of Mines for the year is stated in detail. In this connection there is a full account of a visit paid by the Provincial Mineralogist to Mount Sicker Camp, on the East Coast of Vancouver Island, together with descriptions of its copper mines and the Tyee Smelter. The report of the Provincial assayer gives a summary of the work of the Assay Office, which earned $1,387 during the year in assay fees, assayers' examination fees and other work. This department melted 173 lots of gold, value $135,098, mostly small deposits by miners, to whom Provincial Government assay certificates were issued. The gold dust received was from widely separated localities and varied very much in value, the extreme being $13.50 and $19.60 per oz.

Besides the customary reports on their respective districts or divisions of gold commissioners and mining recorders, which contain much information, there are reports on the examinations for assayers and coal mine managers, respectively; on the inspection of metalliferous mines; on coal mining, and that of the special commission appointed to inquire into the "Causes of Explosions in Coal Mines." There is much other detail relative to mines and mining. The important smelting industry of the Kootenay and Boundary is scarcely noticed, however. It may be there was little that is new to chronicle about it. The report is illustrated, the engravings, including 24 views, chiefly of Coast or Northern subjects, the lower interior being left out altogether in this report.

Other tables, additional to those already given, appear in the report. From these the following have been selected as likely to be of general interest:

Production for 1902 by Districts and Divisions.

Cariboo District—		
Cariboo Mining Division	$340,395	
Quesnel Mining Division	160,000	
Omineca Mining Division	40,000	
		$540,395
Cassiar District		426,636
Kootenay East, District		1,477,466
Kootenay West, District—		
Ainsworth Mining Division	$272,967	
Nelson Mining Division	818,494	
Slocan Mining Division	1,608,827	
Trail Creek Mining Division	4,938,395	
Other parts	167,716	
		7,806,399
Lillooet District		31,429
Yale District—		
Osoyoos, Grand Forks and Kettle River Divs. (Boundary Dist.)	$2,782,263	
Similkameen Division	2,700	
Yale Division	58,574	
		2,843,537
Coast Districts—		
Nanaimo, Alberni, West Coast of Vancouver Island, Victoria		4,360,688
Total		$17,486,550

The total production of the Province for all years up to and including 1902 was valued as follows: Gold, placer, $64,627,683; gold, lode, $22,049,732; total gold, $86,677,415; silver, $18,475,882; lead, $10,447,521; copper, $12,256,219; coal and coke, $58,089,572; building stone, bricks, etc., $2,800,000; other materials, $81,929; total values, $189,728,538.

PROSPERITY IN THE NITRATE INDUSTRY.

By CHARLES C. SCHNATTERBECK.

The nitrate of soda industry has just closed the second year of its greatest prosperity. Two reasons are given for this success, namely, the politic management of the producers' combination in Chile, and the energetic propaganda among agriculturists by distributing literature setting forth the advantages of nitrate of soda as a fertilizer.

The financial condition of the industry in the past two years has compared very favorably with other raw materials of value to the industrial world. To illustrate the magnitude of the trade: During the year ending March 31, 1903, the exports of nitrate of soda amounted to 1,341,294 long tons, representing an average selling value, alongside vessel in Chile, of $46,006,384; an export duty paid to the Chilean Government of $16,524,742; and an ocean freight rate to distributing markets of $5,230,947; making a grand total of $67,762,073. To this should be added brokers' commissions.

The net profits accruing to producers from the past year's exports amounted to something like $14,407,177, which is equal to about 31 per cent on the selling price as noted above. This explains why dividends of 5 to 20 per cent could be paid to stockholders in nitrate companies, in addition to the large amounts that were placed to the redemption of debentures, amortization of plant and machinery, and to surplus accounts. In computing these figures the most reliable sources have been drawn upon, and, wherever possible, use has been made of the reports issued by various oficinas.

Before analyzing the above mentioned profits, it should be stated that the present combination was formed in Chile in October, 1900, and represented 79 oficinas, or nitrate works. Active operations were not begun, however, until April 1, 1901. The compact was signed for five years, the primary object being to regulate production and exports according to the quantity of nitrate of soda consumed annually. How successful this plan has been so far, may be judged from the following statistical data. In the first year of the combination, from April 1, 1901, to March 31, 1902, the exports were allotted to 79 oficinas on the basis of 31,273,000 qtls. (1,421,150 long tons). This quantity was subsequently increased to 31,403,000 qtls. (1,427,409 tons). The actual exports, however, were 28,622,946 qtls. (1,301,043 tons), or 2,715,054 qtls. (123,411 tons), about 9 per cent, less than the average quantity agreed to. This reduction is explained by the fact that the number of oficinas in operation was gradually reduced from 79 to 66. In the second year, from April 1, 1902, to March 31, 1903, the number of oficinas in the combination was increased to 81, owing to the starting up of new plants, and the rehabilitation of older ones, that could not operate profitably at the previous low prices. The exports agreed to in the second year amounted to 30,500,000 qtls. (1,386,363 tons), but actual shipments were only 29,508,468 qtls. (1,341,294 tons); showing a decrease of 991,532 qtls. (45,069 tons), or about 3 per cent. Compared with the exports in the first year there is an increase of 885,522 qtls. (40,251 tons), or 3 per cent. Simultaneously, the consumption has grown from 29,720,790 qtls. (1,350,945 tons) in the first year to 31,510,590 qtls. (1,432,299) in the second; equivalent to about 6 per cent. It is noteworthy that the consumption has increased in a greater ratio than the exports, while the difference between the two quantities was widest in the second year. In other words the consumption in the second year exceeded exports by 2,002,122 qtls. (91,005 tons). In Europe the demand has grown from 24,297,746 qtls. (1,104,443 tons) in the first year to 25,149,300 qtls. (1,143,150 tons) in the second; or at the rate of 851,554 qtls. (38,707 tons), say, 3½ per cent. By far the larger part of this consumption is credited to the German and French beet-sugar growers, who are the heaviest buyers in the world. The consumption in the United States, particularly by blasting powder and fertilizer manufacturers, has increased more rapidly than in Europe. In the first year the American consumption amounted to 4,543,088 qtls. (206,504 tons), and in the second to 5,349,212 qtls. (243,146 tons); or at the rate of 806,124 qtls. (36,642 tons), say, 32 per cent.

Production has increased in a somewhat larger ratio than exports. In the first year of the combination, the output amounted to 28,467,088 qtls. (1,293,958 tons), which was 155,858 qtls. (7,085 tons) less than the exports. In the second year the production was 30,772,613 qtls. (1,398,755 tons), or 1,264,145 qtls. (57,461 tons) in excess of exports. The increase in production in the second year is equal to 2,305,525 qtls. (104,797 tons), or about 8 per cent.

Now to consider profits. The systematic regulation of production and exports according to the demand has apparently been very gratifying, at least to the oficinas, because the consumers have had to pay. It is opportune to mention that the combination has endeavored to keep prices, though high, within a margin that would not encourage the consumption of other nitrogenous compounds for agricultural purposes. At certain periods, however, consumers, particularly in Europe, have found it more advantageous to purchase sulphate of ammonia at a higher price, as it is richer in nitrogen than the Chile saltpeter. The average selling price of ordinary and refined nitrate of soda alongside vessel in Chile in the first year of the combination was 6s. 7d. per qtl. (£7 4s. 10d., or $35.18 per ton). In the second year the average was 6s. 5d. per qtl. (£7 1s. 2d., or $34.30 per ton). Deducting from the latter figure the average cost of production and delivery at seaport of 4s. 6d. per qtl. (£4 19s., or $24 per ton) there remains a profit of 1s. 11d. per qtl. (£2 2s. 2d., or $10.30 per ton). It may be said that some oficinas with improved machinery are realizing larger profits, while others that are still working on antiquated methods make less. It should also be mentioned that the difference in the selling price of ordinary and refined nitrate of soda seldom averages more than 2d. per qtl. (3s. 8d., or 88c. per ton). Ocean freight rates, which play an important part in the export trade, averaged in the second year about 9d. per qtl. (16s. 3d., or $3.90 per ton), the highest monthly average being 18s. 9d., or $4.50 per ton in August, 1902, and the lowest, 12s. 6d. or $3 in November. Compared with the average of 23s. 4d., or $5.60 per ton in the first year, there has been a falling off of 3d. per qtl. (7s. 1d., or $1.70 per ton). This difference is little more than the comparison between the average selling prices of nitrate in the two years.

In discussing the prospects for the third year of the combination, that is, beginning on April 1, 1903, cognizance should be taken of the fact that selling prices in Chile are now about 3d. per qtl. (5s. 6d., or $1.32 per ton) lower than they were a year ago. Fortunately, however, many charters for vessel room have been booked on the basis of 12s. 6d., or $3 per ton, or at a little more than 6d. per quintal. Importers are of the opinion, though, that higher freight rates will rule, and believe an advance to 21s. 3d., or $5.10 per ton, is not unlikely before the close of the year. It does not seem probable that rates will again touch the high level of 1901, the first year of the nitrate combination, as competition is keen among ship owners. Of course, unforeseen circumstances, such as the wrecking of large steamers en route, as were reported last year, or an unprecedented demand for room, may influence the situation. Otherwise a top rate of 21s. 3d. is sufficiently remunerative to ship owners. An eye should also be kept on the prospects for dissention in the producers' combination over the revision of quotas to permit the listing of new oficinas. The abolition of bounties on beet sugar in European countries, which will become effective on September 1 next, will probably cause apprehension, as lower prices for sugar mean less for nitrate of soda. And last, but not least, consideration should be given to the development of the California nitrate industry. Already much money has been invested in the Death Valley deposits, and if reports prove true, there will be American nitrate of soda on the market before the expiration of the Chilean combination.

In the electrolytic refining of gold bullion from a chloride solution, the deposited gold is about 999.8 fine; in the case of gold bullion containing silver, a very small amount of silver is deposited with the gold, owing to the fact that silver chloride is slightly soluble in a strong solution of gold chloride containing hydrochloric acid or an alkaline chloride.

ABSTRACTS OF OFFICIAL REPORTS.

International Nickel Company.

This company's first annual report covers the year ending March 31, 1903. The company owns the Canadian Copper Company, the Orford Copper Company, the American Nickel works in this country; the Nickel Corporation, Limited, the Societe Miniere Caledonienne in New Caledonia; a large interest in the Societe Le Nickel, besides other minor properties. The balance sheet at the close of the year was as follows:

Common stock	$8,741,506
Preferred stock	8,741,506
Outstanding stock of constituent companies	914,074
First mortgage 5% bonds	9,903,441
Orford Copper Co. mortgage	60,000
Depreciation fund	121,693
Surplus account	559,149
Current liabilities	1,321,658
Total liabilities	$30,363,027
Investments in constituent companies, less surplus of those companies	$26,421,205
Ray copper mine debentures	40,000
Advances to constituent companies	188,490
Current assets	3,713,332
Total assets	$30,363,027

The profit and loss account shows earnings of constituent companies, less selling and administrative expenses, $1,090,401; interest, $29,016; total, $1,119,417. General expenses, $110,024; interest on bonded debt $450,244; total, $560,268, leaving a surplus of $559,149 for the year.

The accounts of the Nickel Corporation, Limited, and the Societe Miniere Caledonienne, which are made up in New Caledonia, were not received in time to be included above.

The directors' report says: "As was expected from reports submitted prior to the organization of the company, a careful examination of the various manufacturing plants has shown them to be in very bad condition, nearly all the machinery being very old, and much of it obsolete, expensive to maintain and operate. Expenditure for repairs on the Canadian, the Orford and the American nickel works was $225,435 during the year. This is excessive and should eventually be largely reduced.

"The smelting plant of the Canadian Copper Company in Canada is badly located; the furnaces are small and costly to operate, the steam and power plants also being very extensive to maintain and operate. There is a total lack of machinery for handling ore and material economically. The locomotives and cars are old and inadequate. At the works of the Orford Copper Company in New Jersey, conditions are not so bad as in Canada, but the plant is old, badly arranged and expensive to operate. The plant of the American Nickel Works in New Jersey is old, and not arranged to the best advantage, but as the tonnage of material handlled is small and relatively high grade—such as cobalt, for instance—these conditions are not serious.

"Our intention was and is to reconstruct the plants of the constituent companies, bringing them up to the highest standing of metallurgical and economical efficiency. The past year has been devoted to a study of the various plants and the best means for improving same. During this time only such improvements have been made as were as absolutely necessary to keep these plants in successful operation, and produce the required amount of metals, the changes being made such as would fall within the general scheme of reconstruction.

"During the past year at the Ontario Works of the Canadian Copper Company, it was found that the capacity for calcining and refining matte wholly inadequate to treat the product of the Canadian Copper Company's blast furnaces, and to supply sufficient high-grade nickel matte for the Orford Copper Company's works. There has been installed at these works a third Brown calcining furnace of larger capacity than the two furnaces there in operation. The older furnaces have been increased to 40 ft. in length, a cooling device, conveyers and a briquetting plant to handle mechanically the product of the calcining furnaces, are now being installed. These improvements, now nearly completed, will double the capacity of the plant, and materially reduce the cost of treatment per ton.

"At the Orford Copper Company's works new boilers and engines were installed to furnish additional blast necessary to increase capacity of works. A new nickel refinery has been erected to provide the increased quantity of nickel required as metallic nickel, and to reduce the cost of such refining. The old nickel refinery has been abandoned, first, because it was located on leased ground; it was expensive to operate; it was inadequate to supply required amount of nickel; and there is no room for increase in plant.

"We are now building a new smelting plant at the Orford Copper Company's works, in Canada. New works will be equipped with the best and most economical steam and power plants, blast furnaces, ore and matte handling devices, together with new locomotives and proper cars for handling the ore to the furnaces. The cost of this plant is estimated at $500,000, and the estimated saving is $200,000 to $250,000 per year. It is expected that the new plant will be in operation within one year from the present time. When this improvement is completed the Orford Copper Company's works will be reconstructed on modern lines, thereby effecting a very large saving. As the amount of these savings is based on the present average output, they will be much greater when the output can be increased.

"The cost of our operations has been high, not only from the excessive repairs necessary to keep our plants in operation, but from the very high price of coal and coke, and the high price of labor. In addition to this we have had to contend with the low price of copper prevailing during the year. The prospects for the current year are better than for the past year; the demand for nickel is increasing and copper is at a much higher price than in 1902. When the Canadian Copper Company's new plant is completed, the saving should add largely to the earning capacity of the properties.

"In view of the conditions above set forth the management feels that the net profits have been very satsifactory. Every effort is being made to introduce nickel into new fields and to extend its use in old lines, particularly to extend the use of nickel-steel. The results have been very gratifying; about 12,000 tons of nickel rails, 3.25 per cent nickel, have been purchased by the American railways and are nearly all manufactured. Seamless drawn tubes, containing a high percentage of nickel, have been successfully manufactured, and we look for an important market for these tubes. In addition to this, it is quite probable that within a very short time, nickel steel will be largely used in bridge construction. Success in these efforts to extend the use of nickel will mean a large increased production and large increased earnings for our company."

General Mining & Finance Corporation.

This company owns or controls a number of gold mining properties in the Transvaal. The following statements are taken from the address made at the annual meeting in Johannesburg, recently, by the chairman, Mr. George Albu. They cover the year 1902.

Mr. Albu said that considerable success attended the operations of the corporation during the past year, and the results are the more satisfactory when it is considered that they constitute the first year's record of the company's existence since it emerged as a public concern, and added a large number of shareholders to its register. The accounts show that, for the year under review, a net profit was realized of £328,554, which, with the balance of £93,149 brought forward from 1901, gives a total available profit of £421,703. Out of this, two dividends of 10 per cent each, making 20 per cent for the year, have been declared on the ordinary shares, absorbing £199,800; while the founders' shares, which, in accordance with the articles of association are entitled to 25 per cent of the profits set aside for distribution after 10 per cent is paid in any one year on the ordinary shares, will receive £33,400. After making provision for certain extra remuneration to the directors, and commissions due to members and staff under their agreements, there is a balance of profit remaining of £176,179, which is carried forward to the 1903 accounts. The final dividend of 10 per cent declared on March 9 last, was payable to shareholders registered on March 23.

The directors, in determining what should be considered as net profit, had it before them that only actually realized net earnings should be taken into consideration, and these should be arrived at in such a manner as not to entrench upon the hidden reserve, which has been built up in the past by the application of profits to the acquisition of additional assets, and which to-day is represented by the unrealized increment of profit on the investments. Besides the realized profit shown, not only have the assets been increased by over £600,000, but the share investments, reckoned at the Stock Exchange making-up prices at the end of 1902, indicate a margin even larger than the surplus shown in our last annual statement. The share investments are taken into the balance-sheet either at the Stock Exchange making-up prices at the end of November, 1902, or at figures which represent cost, less amounts which have from time to time been written off, whichever is lower. In no case has the value of any asset been written up, and, in fact, the shareholdings stand at figures considerably below current market quotations. Their value, estimated at the prices current at the end of last year, shows an excess of £1,228,000 over and above the figures at which they appear in the balance-sheet. The claim holdings, other mining ground, and real estate also show a considerable appreciation in value over the prices at which they were acquired.

Turning to the financial position of the corporation, the liquid assets, comprising cash at bankers and in hand, bills receivable, sundry debtors, stocks sold but not delivered, advances against securities, and debentures of public companies, secured by first mortgage, amount in all to £982,456, of which £226,630 is actual cash. Deposits amount to £745,541. There are also sundry creditors, including stock bought but not yet taken up, totaling £254,678, and bills payable, £20,281. Taking the current quotations for the share investments and placing a very moderate valuation on claim holdings, and real estate properties, that at the date accounts were made up the assets including cash in hand, exceed the issued capital of the corporation and its actual contingent liabilities, by approximately £2,000,000. No material change has taken place in the character of the assets, which comprise shares and debentures in Main Reef outcrop and deep level mines under the management of the corporation, shares in mining, estate, land, financial and miscellaneous companies, undeveloped mining claims and farms, and real estate property and buildings in Johannesburg. The bulk of the share investments are in the nine mines identified with the corporation and under its control, comprising the Meyer & Charlton, Roodepoort United Main Reef, New Gooh, Van Ryn, Aurora West, Cinderella Deep, New Steyn, Violet and West Rand mines. In these nine companies we hold 729,037 shares, standing in the books for £1,050,504, or an average of about 29s. per share. Under the heading of miscellaneous companies, etc., it owns 256,912 shares, taken at £124,955, or an average of 9s. per share. The assets also include £266,485 first mortgage debentures in mining companies, a portion of which carry an option to convert into shares. Mining properties consist of 292 claims, mostly deep levels, situated on the Main Reef series, standing in for £73,813, or an average of £260 per claim. Also 32 claims in outside districts. The real estate properties and buildings cost £51,966. Holdings in the nine compannies under the management of the corporation represent 24.7 per cent of their total issued capital of £2,945,000, equivalent to 745 mining claims.

The commissioners of inland revenue in London some time ago advanced the surprising claim to assess the whole of the profits of companies registered in South Africa (and having London branches), irrespective of whether they were earned in London

or South Africa. This corporation was included among such companies, and, regarding this taxation as unfair, joined hands with other South African companies to fight the proposed impost. Test cases were brought on the point at issue, and eventually the question was taken to appeal after adverse decisions had been given in the lower courts. Apparently the inland revenue authorities have withdrawn from their original attitude on the subject.

The progress made since the issue of the last annual report, in the re-establishment of the Rand mining industry has been as satisfactory as could be expected under the adverse conditions which have predominated. Owing to the depression which prevails at the present moment, due to the difficulties which surround the solution of the labor question, a pessimistic feeling holds sway; nevertheless, when one remembers that it was not until the end of May, 1902, that peace was declared, and that for several months afterwards lack of railway transport and an insufficiency of mining supplies prevented rapid advancement, one must acknowledge that, after all, considerable headway has been made. Moreover, the war left, as one of its legacies, plant and machinery which required extensive repairs and renovation, and it speaks volumes for the energy which has been displayed, when it is recognized that perhaps 95 per cent of the mines which were producing prior to the war, are to-day in a position to resume operations as soon as labor is obtainable. In January of last year there were only 21 mines, with 1,075 stamps at work, and the gold output for that month was 70,340 oz. Compare this with the March returns just published, when there were in all 52 mines crushing, employing 3,120 stamps, which produced 216,466 oz. gold. In August, 1899, there were 5,970 stamps in operation, and the output amounted to 482,109 bullion oz., equivalent to approximately 406,000 fine oz. Therefore, the main fact must not be lost sight of, that, in spite of the difficulties which have had to be contended with, the mines have, roughtly speaking, now arrived at the half-way house towards reaching the level which the industry had attained prior to the war. Continued, but slow, advancement is being still recorded, and the process of rehabilitation, although occasionally interrupted, has never been effectually arrested. The rate of progress is, of course, entirely dependent upon the supply of colored labor, and until some solution is found for this problem, further and rapid advancement cannot be predicted. A year ago only one of the mines under the management of the corporation—the Meyer & Charlton—had resumed crushing. Since then, both the Goch and the Roodepoort United have recommenced gold production, and it is anticipated that, by June, it will be possible to start up a portion of the Van Ryn mill. The Aurora West will then be the one producing mine of the group remaining idle. As, however, the native labor supply has, so far, only reached an average of about one-half the normal requirements, it has only been possible to work with a portion of the stamping capacity at the mines which have restarted, and, in consequence, the outputs and profits declared during the past year do not represent the capabilities of these companies under ordinary conditions. For this reason, and owing chiefly to the fact that the same staff, for administration purposes, and the same number of surface hands, have to be employed to run a portion of the mill as for the entire plant, the expenditure, in proportion to the quantity of ore treated, has been abnormally high. The aim the directors had in view was to start up each mine at the earliest possible date, regardless of the results obtained, so long as the main object of again bringing together the staffs and effecting the reorganization of the work was accomplished. Having done this, everything is in readiness for employing the whole of the stamping capacity as soon as labor is available. Although crushing was not started at the New Goch until March, and at the Roodepoort United until May, 1902, these two companies, and the Meyer & Charlton, treated 179,060 tons of ore, and produced gold to the value of £357,390, yielding a profit of £102,030 during the past year. The Meyer & Charlton declared two dividends of 15 per cent, making 30 per cent in all. Had it been possible to carry on operations for the whole year with the number of stamps at work prior to the war, the output of these three mines would have been between £500,000 and £600,000, and the profits from £250,000 to £300,000.

In conclusion, Mr. Albu reviewed the general situation in the Transvaal at considerable length. The conditions as to labor, taxes, costs, etc., have already been discussed in our columns. His forecast of the future points to profitable and successful work.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

Canadian Society of Civil Engineers. Report of Annual Meeting, 1903. Montreal, Canada; published by the Society. Pages, 76.

Bulletin de la Societe de l'Industrie Minerale. Volume II, Part 2. St. Etienne, France; published by the Society. Pages, 278; illustrated.

Die Herstallung der Akkumulatoren. By F. Grunwald. Halle-a-S.; Germany. Wilhelm Knapp. Pages, 160; illustrated. Price (in New York), $1.

United States Geological Survey. The Production of Aluminum and Bauxite in 1902. By Joseph Struthers. Washington; Government Printing Office. Pages, 12.

Geological Survey of New Jersey. Report on Paleontology. Volume III. The Paleozoic Faunas. By Stuart Weller. Trenton, N. J.; State Printers. Pages, 462; illustrated.

Transvaal Mines Department. Statistics for the Half-year Ending December 31, 1902. H. Weldon, Government Mining Engineer. Pretoria, Transvaal; Government Printing Office.

New York State Museum. Bulletin No. 62. Mutual History Museums in the United States and Canada. By Frederick J. H. Merrill. Albany, N. Y.; published by the University of the State of New York. Pages, 236. Price, 50 cents.

New York State Museum, Bulletin No. 61. Quarries of Bluestone and Other Sandstones in the Upper Devonian of New York State. By Harold T. Dickinson. Albany, N. Y.; published by the University of the State of New York. Pages, 112; with maps and illustrations. Price, 35 cents.

Geologic Atlas of the United States. No. 83. New York City Folio. No. 90. Cranberry Folio, North Carolina and Tennessee. No. 87. Camp Clarke Folio, Nebraska. No. 88. Scott's Bluff Folio, Nebraska. No. 89. Port Orford Folio, Oregon. Washington; engraved and published by the United States Geological Survey.

BOOKS REVIEWED.

Estudios sobre los Carbones de Teruel, y Especialmente sobre la Cuenca de Utrillas. By Antonio Gascon and Emiliano de la Cruz y Diaz. Madrid, Spain; Ricardo Rojas. Pages, 172; illustrated.

This volume is a very complete technical and practical account of the coal-fields of the province of Teruel in Spain. Although dealing chiefly with the Utrillas basin, it contains a great deal about the entire field, of which geological maps and sections are given with the book. The coal-field referred to has been known over 140 years, glass-works and a forge having been started in the vicinity of the field in order to utilize the coal as far back as 1760. In recent years the region has been opened up by the construction of a branch railroad which furnished transportation for the mines. The most important seams of coal found are in Cretaceous strata. The coal occurs at two horizons, the first containing 10 seams of varying thickness, and the lower three seams, the thickness of which is from 0.6 to 2 meters, the distance between two successive seams varying from 15 to 25 meters. The seams of the upper horizon have not been worked to any extent, being generally broken up and difficult to mine; the mines opened have been on the coal of the lower seams. The best coal found in the province is the Utrillas coal which carries about 55 per cent fixed carbon and 5 per cent ash, the balance being moisture and volatile constituents. The proportion of sulphur is about 1.4 per cent. This coal should be classed, probably, as a high quality of lignite. The coal of the upper horizon, so far as it has been analyzed, contains a much higher proportion of ash, and is more uniform in quality than that of the lower veins. In practice the coals of the province are found to be generally a fair steam coal and a good gas coal, very readily distilled and yielding a considerable proportion of by-products, which can be utilized in chemical works. Coke of fair quality has been made. The principal defect of the coal is its disintegration when exposed to the air, but it makes excellent briquettes, and will probably be utilized very largely in this way. These deposits are of especial value in Spain, a country which is very poor in mineral fuel, and now that proper transportation has been supplied, the Utrillas and other coals of the district, which can be easily mined, will probably meet with a wide market.

The book is carefully prepared, giving a very good account of the field, and is well printed and illustrated.

Mond Gas. Philadelphia; prepared and issued by R. D. Wood & Co. Pages, 104; illustrated.

This handsomely printed and illustrated book goes so far beyond the ordinary trade catalogue that it fairly deserves review in this column. While it is intended, to a certain extent, to advertise the company which issues it, the work contains much information and valuable data, which will be of service to the engineer who is preparing to build a power plant for any purpose. R. D. Wood & Co. have done much good work in pushing the use of producer gas, and have built many plants of various types. They have now taken up the Mond producer, which is the latest development in this line. In this book—or catalogue—the Mond producer and its applications are very clearly explained; its economy is described, and full data are given as to its work and the savings which can be effected by its use. The latter is due not only to the low consumption of fuel for a given amount of power, but to the saving of by-products in the process. Besides the description of the process, with full figures of cost taken from existing plants, details of work done by gas engines, using Mond gas, are given. The use of the gas in metallurgical works is also treated in detail. The illustrations are very good and help materially the explanations in the text.

New York to Newfoundland. By Marion Varian. New York; pages, 44; illustrated.

This is a very bright and agreeable account of a sea trip from New York to Newfoundland and return by an "Appreciative Passenger," who made the trip to secure rest, and found, besides that, an entertaining variety of adventure. The writer—who, it may be said, is connected with an important technical concern—describes what she saw on her trip so well, that one is inspired with a desire to follow her example, and indulge in a visit to the little-known shores of the great island, which is so near us, and yet so seldom visited. It also leads one to wish that when the "appreciative passenger" again takes a rest from her technical work, she may give us a new history of her further wanderings.

A LARGE DIAMOND.—A diamond, taken from the Premier Mine in South Africa, was recently on exhibition in Johannesburg. It weighs 67.5 carats, but is rather irregular in shape, so that it will probably cut down to 30 carats, when finished. Its value is estimated at $15,000.

THE "EAGLE" OIL ENGINE.

An engine of a novel type is manufactured by the Eagle Engine Company, of San Francisco. This engine uses distillate as fuel, and has no valves nor battery. The important feature is that the power is developed by the expansion of compressed air, heated by a burning jet of oil, introduced into the cylinder of the engine at the moment of highest compression. The engine was designed especially for the use of 35° gravity oil, which stands a flash test of 160° to 200°; but ordinary engine distillate, kerosene, or other oils can be used if desired.

The Eagle is a two-cycle, self-contained, side-crank engine, with enclosed dust-proof crank-case. The charges are ignited by a hot ball attached to a combustion chamber, cast in the cylinder-head. The combustion chamber is one of the main features of the engine, amply protected by patents, and makes possible the use of low-grade fuel without deposit of carbons or other refuse in the engine cylinder.

The ball is heated in starting the engine by a torch, and is kept hot by the heat of the burning oil in the engine cylinder while the engine is running. The piston overruns three ports—the inlet and exhaust ports to the cylinder, and the admission port to the crank-case. Moving toward the crank, the piston compresses air in the crank-case, and forces it at the end of the stroke, through the inlet port to the cylinder. This air, under about 4-lb. pressure, strikes a deflector on the piston-head, makes a full sweep of the cylinder, drives out the burnt gas and fills the cylinder with fresh air. On the return stroke, the piston compresses air in the cylinder and, at the moment of highest compression, the fuel pump injects a charge of oil into the combustion chamber. The vapor generated when the oil strikes the warm walls of the combustion chamber is ignited by the ball, and the oil burns in a flash, generating an intense heat. The result is a powerful expansion of the compressed air, which is continued throughout the stroke. The manufacturers claim a complete combustion of the fuel, an efficient use of oil, and more power per gallon of oil than can be obtained by any engine of the explosive type.

With fuel costing 5c. per gallon, the engine is guaranteed to furnish one horse-power per hour for 0.5c. Fuel is used in proportion to the work done by the engine, and that the above guarantee is not the limit of the fuel efficiency of the engine, is shown by the record of a 5-h.p. Eagle engine, which during a period of two months, furnished continuously from 3½ to 4 h.p., on a consumption of less than 3 gals. of oil for each 9 hours run.

Aside from the economy in cost of operation, the Eagle has a very close regulation of speed. A shaft-governor located in the fly-wheel acts direct on the fuel pump. From half to full load, the variation will not exceed 2 per cent. The speed can also be adjusted while the engine is running. The engine has been carefully designed, and is simple and neat in appearance.

GAS FROM CHALK.—The London *Colliery Guardian* reports the discovery of a process by which chalk, mixed with 10 per cent of coke breeze, can be converted into lime at a low cost, while producing at the same time a large quantity of fuel gas.

SULPHATE OF AMMONIA IN CANADA.—The production of this important fertilizer ingredient has grown in recent years with the introduction of the by-product coke ovens in Nova Scotia. At Sydney the Dominion Iron and Steel Company has extensive works; in Quebec, Ottawa and Toronto, the ammoniacal liquors from the gas works are treated by the Michigan Ammonia Company, and in Montreal a concern manufactures sulphate of ammonia for its own use. Exports are frequently made to the United States, where a good price is paid and the demand is increasing.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

WHEN ACT OF OFFICIAL WILL BE DEEMED AUTHORIZED BY CORPORATION.—All the capital stock of a mining corporation was owned by a man, his wife and daughter. The husband acted as president of the company, and conducted all the business of the corporation. The company sold certain realty, the deed being placed in escrew to be delivered on the payment of the price, and later the president authorized delivery upon payment of a sum less than the entire price, which was not then due. The wife, who together with the husband, held practically all the stock, consented to such an arrangement. This was held to be sufficient to show that the president had authority to authorize the delivery of the deed, though no express authority to do so appeared in the minutes of the corporation.—Rubie Combination Gold Mining Company v. Princess Alice Gold Mining Company (71 *Pacific Reporter*, 1121); Supreme Court of Colorado.

LAND OFFICE CANNOT CHANGE RECORDS WITHOUT NOTICE TO PARTIES.—A strip of land in controversy between two mining locations was included and described in the location certificate of C. claim; but when application for a patent of the same was filed, which was after the adjoining R. claim was made, the conflicting strip was excluded from the C. location, and by agreement of the parties was intended to be included in the R. claim. The owners of the latter claim amended their papers and when final proof was made the conflicting strip was included in the description in the final certificate of the purchase issued by the land department; but afterwards the land commissioner without notice to the owners of the R. claim changed the records of his office by excluding the conflicting territory, and the subsequent patent did not contain the same; whereupon another located the conflicting strip as another claim, at which time the owners of the R. claim were in possession of the land under claim of ownership and requested such new locator not to enter. It was held that the attempted exemption by the land department was void, and that by the receiver's receipt the owners of the R. claim acquired a vested right to have a patent to the same as against such new locator; also that the mere exclusion of an entry of a mining location does not render the grant irregular.—Rebecca Gold Mining Company v. Bryant (61 *Pacific Reporter*, 1110); Supreme Court of Colorado.

DUTY ON COLD-ROLLED STEEL, BRIGHTENED OR POLISHED.—The provision in paragraph 141, act of July 24, 1897, that "on all strips, plates or sheets of iron or steel of whatever shape, other than the polished, planished or glanced sheet iron or sheet steel hereinbefore provided for, which are cold rolled, cold hammered, blued, brightened, tempered or polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only, hereinbefore provided for, there shall be paid 1 cent per pound in addition to the rates provided in this act upon plates, strips, or sheets of iron or steel of common or black finish," is to be taken in a distributive sense; and in order to ascertain the rate upon steel strips which have been brightened to a perfected surface finish or polish better than the grade of cold rolled, smoothed only, it is only necessary to ascertain what rate or rates are provided in the act upon common or black finish steel strips; it is not necessary to consider the rates fixed by the act upon plates or sheets of iron or steel of common or black finish. Cold-rolled steel strips which have been brighened or polished to a perfected surface finish or polish better than the grade of cold rolled, smoothed only, are dutiable under the provisions of paragraph 141 of said act at the rate of 1 cent per pound in addition to the rates imposed by said act on common or black steel strips of corresponding gauge and value.—Appeal of Boker and others from Collector of Customs at New York; Board of General Appraisers.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
Letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

Mining in Jalisco, Mexico.

Sir.—I hope you will allow me to say a word in your valuable paper in defense of the mining interests in the State of Jalisco, more particularly in refutation of the account given by your special correspondent at San Luis Potosi. I do not know where he gets his data. Some of the properties mentioned by him are not located in the districts in which he places them. He seems to take particular pains in condemning the Santo Domingo Mine, whose past record shows it to have been one of the largest producers in Mexico. He speaks of the property being sold on a "little find." This "little find" has been proven to contain over 10,000 tons of ore, with an average value of 120 oz. of silver, and 1.25 oz. gold. Furthermore, the mine has not been robbed of its pillars. The property never was offered for sale before for less than $500,000, Mexican, which option was held by the London Exploration Company, whose expert, Capt. A. C. Jenkins, did not turn the property down, but considered it too small for his company.

Another option was held by New York capitalists, whose expert refused to examine the mine because the ladders soiled his kid gloves, also considered his life too precious to trust it to the chicken-ladders, which was the only way to enter the property, taking his samples, 12 in number, from ore on dump, and saying in his report that the expense of equipping the property would not warrant purchase price.

Your correspondent speaks of the property being heavily mortgaged and in this way keeping up the appearance of a mine. This is absolutely untrue, as the company does not owe one dollar, having about $50,000 in the treasury.

While I am not an interested party in this particular property, I am working another property which compels me to pass by the Santo Domingo almost daily, and frequently visit the inside workings. While all legitimate mining men are down on all wildcat schemes, your correspondent's attack on the Santo Domingo was entirely unwarranted and without foundation.

I believe that your sense of justice will lead you to make a correction.

E. J. CALLAHAN.

Guadalajara, Mexico, May 29, 1903.

QUESTIONS AND ANSWERS.

Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.

Chrome Ore.—Can you tell me what the production of chrome ore, or chrome iron ore, was in the United States in the year 1902? What is the market value of the ore?—G. R. C. S.

Answer.—Only 315 tons of chrome ore were mined in the United States in 1902, all in California. The old mines in Pennsylvania and Maryland have been closed for several years. There were 39,570 tons of the ore imported last year. The greater part of these imports came from Turkey. Some came also from Canada. The current quotation for chrome ore, 50 per cent chromic acid, is $24 75 per long ton, ex ship, New York.

Lithographic Stone.—A deposit of lithographic stone has been discovered in this section of the State. What is its value? Has any stone of this kind been worked to advantage in the United States? —J. L. R.

Answer.—Lithographic stone is a valuable product. It sells at from 20 to 40c. per pound, the price depending upon the quality and the size of the slabs which can be taken. Size and uniformity of grain and texture are the important points in determining the quality and price. Most of the stones used are imported from Germany, the Bavarian stone being the best. Lithographic stone has, however, been quarried in the eastern part of Kentucky for a number of years. The region where it is found is on the Licking River in Bath, Rowan and Menifee counties.

A full description of these Kentucky deposits, and of the methods of handling the stone, was given in the ENGINEERING AND MINING JOURNAL, of June 28, 1902.

Tellurium in Ores.—I wish a scheme for detecting and estimating tellurium in ores, both qualitatively and quantitatively. Can you favor me with a method for making these analyses?—J. G.

Answer.—The simplest qualitative test for a suspected telluride mineral is to take a fragment of it, place it in a white porcelain dish, add a couple of drops of undiluted sulphuric acid, and apply heat. If it is a telluride, a splendid rose-madder will suffuse the colorless acid. For quantitative assay, oxidize with nitric acid, removing the latter by evaporation with sulphuric acid. To the strong sulphuric acid solution a liberal amount of hydrochloric acid is added, and then sulphur dioxide gas is led into the solution, which precipitates the tellumium in metallic form. This precipitate should be filtered into a Gooch crucible, dried in an air bath at 100° C. and then weighed.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon the receipt of 25 cents. In ordering specifications correspondents are requested to name the issue of the JOURNAL in which notice of the patent appeared.

Week Ending June 2, 1903.

729,540. FURNACE.—Elbert H. Carroll, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass. In a billet-heating furnace the combination with a heating-chamber having a floor or hearth provided with an opening, of a billet-turning mechanism arranged to move vertically through said opening and engage the billet as it rests upon said floor or hearth.

729,541. WIRE-DRAWING BLOCK.—Elbert H. Carroll, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass. A wire-drawing block having a flange and a sliding grip mounted to slide axially on the drawing-block to which an end of the wire being drawn is secured, and between which grip and the flange on the end of the block the wire is crowded as the successive coils are wound upon the block.

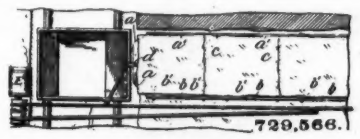
729,559. ROLLING-MILL.—Victor E. Edwards, Worcester, Mass., assignor to the Morgan Construction Company, Worcester, Mass. In a rolling-mill, the combination of a train of two pairs of rolls, each of said pairs of rolls having different diameters, pinions by which said pairs of rolls are connected, the rolls of each pair being connected by pinions of different diameters respectively, and with two pinions, one for each pair carried on the same shaft.

729,562. PETRIFACTION OF CLAY.—Bernard J. Fallon, Summit, N. J. A process of petrifying bricks or the like, which consists in partially burning the bricks, then cooling the same, then subjecting them to the action of steam, which penetrates the entire body of the bricks, and then completing the burning.

729,569. CARRIER FOR THE TOP ROLLS OF ROLLING-MILLS.—Jerome R. George, Worcester, Mass., assignor to the Morgan Construction Company, Worcester, Mass. The combination with a rolling-mill housing and a pair of rolls held therein, of means for supporting the upper roll of said pair and consisting of a block resting upon the gudgeon of the lower roll, a block bearing against the gudgeon of the upper roll with one end of the upper block in contact with the corresponding end of the lower block and means for separating the opposite ends of said blocks, whereby the lower block is crowded against the gudgeon of the lower roll and the upper block is crowded against the gudgeon of the upper roll.

729,570. METHOD OF REDUCING RODS OR BARS.—Jerome R. George, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass. A method of consecutively reducing a rod or bar in cross-section which consists in passing the rod or bar between two rolls and conducting or transferring the advancing end of the rod or bar around one of the housings of the rolls and thence between the rolls again and so on until suitably reduced in cross-section.

729,566. METHOD OF MINING COAL.—Washington Foglesong, Dayton, Ohio. A process of mining coal which consists in forming a kerf of usual dimensions at the bottom of the wall and along the same, then placing hauling-trays in said kerf from the side of the wall, then breaking the coal upon the trays, then hauling the coal away upon said trays.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729,573. PROCESS OF UNITING METALS.—Hans Goldschmidt, Essen-on-the-Ruhr, Germany, assignor to Clarence B. Schultz, Berlin, Germany. A process for adding metal pieces or filling out hollow spaces by casting, consisting in igniting a mixture of a metal compound with aluminum, removing the alumina resulting from the reaction taking place and then casting the highly-heated metal into the spaces.

729,614. PROCESS OF TREATING MATERIALS BY RADIATED HEAT IN ELECTRIC FURNACES.—Carl G. P. de Laval, Stockholm, Sweden. A process of treating material in an electric-furnace chamber which consists in introducing said material to form a stack having its sloping side facing the source of heat and controlling the temperature at said side and consequent rate of consumption of material thereat by mechanically decreasing the distance between said side and the source of heat.

729,617. COMPOSITION FOR USE IN PRODUCING METAL CASTINGS.—Calvin W. Link, Jersey City, N. J. A composition for use in producing metal castings, consisting of silica, corn-oil and a petroleum product.

729,643. METHOD OF MAKING SULPHURIC ACID.—Max Neumann, Hamborn, Germany, assignor to Franz Meyer, Hamborn, Germany. A method of making sulphuric acid, consisting in conducting the acid-producing gases through a plurality of Glover towers, and through alternate heating and cooling zones intermediate of said towers.

729,681. FURNACE.—Theodore G. Selleck, Chicago, Ill., assignor to Acme Steel Company, Chicago. In a furnace of the class described, provided with a box, a combustion-chamber, a flue extending forwardly from said chamber and below and longitudinally of said box, flues extending along each side and across the top of said box, partitions extending longitudinally of said box and separating said first-named flue from said lateral flues, and a vertical flue connecting said first-named fiue at its forward end with said lateral and top flues.

729,711. PROCESS OF MAKING ARTIFICIAL FUEL.—Georges Adrot, Marseilles, France. A process of making artificial fuel which consists in incorporating petroleum with sodium resinate, adding pulverized or granular carbonaceous material thereto, mixing the resulting product in a heated condition with water, containing a metallic salt, and cooling and drying the product.

729,712. METAL-HEATING FURNACE.—Thomas V. Allis, Bridgeport, Conn. A furnace for heating metal, having an endless heating-chamber, said chamber consisting of straight passages arranged at an angle to each other, and means for moving metal along said passages.

729,713. FURNACE FOR HEATING METAL.—Thomas V. Allis, Bridgeport, Conn. A furnace for heating metal, comprising a heating-chamber having a hearth and an opening or openings for receiving and delivering the metal, and means for moving the metal over the hearth along an angular path extending from and returning to said opening or openings.

729,714. PROCESS OF MANUFACTURING METAL SHEETS.—Thomas V. Allis, Bridgeport, Conn. A process of producing metal sheets in pack which consists in superposing upon the contact-surfaces of metal plates or sheets in pack, a coating of finely-comminuted soapstone and subjecting the pack to heat and pressure and thereby reducing the plates therein to sheets.

729,735. PROCESS OF MANUFACTURING SULPHURIC ANHYDRIDE.—Adolf Clemm and Wilhelm Hasenbach, Mannheim, Germany. A process of manufacturing sulphuric anhydride by first leading hot roaster-gases over a mixture of the oxides of copper and chromium, then causing them to pass through a filter of porous substances and finally bringing them in contact with platinum contact substance.

729,743. UNDERREAMER FOR DRILLING OIL-WELLS. Moses H. Dunn, Fullerton, Cal. In an underreamer, the combination with a body, of bits pivoted thereto, means for spreading the bits from the body, and guide-ribs extending lengthwise of the bits and located on the outer faces thereof which prevent injurious contact of the bits with the well tubing.

729,752. PRODUCTION OF ALLOYS.—Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. In an apparatus for making alloys, a series of receptacles for molten metals, each having a discharge-outlet, and means for gradually and inversely varying the discharge of metals from said outlets.

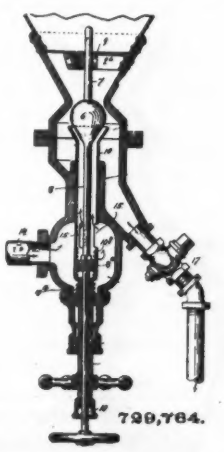
729,753. SUBAQUEOUS MAGNETIC SEPARATOR.—Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. A subaqueous magnetic separator, provided with an electromagnet, a water-tight jacket incasing the coil of said electromagnet, and through which passes the magnet core, said magnet-core having a covering-plate.

729,754. METHOD OF CASTING ALLOYS.—Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. A method of producing a succession of alloys varying in relative proportions of the constituent metals, which consists in causing streams of the melted component metals to intermingle, one of said streams gradually increasing while the other gradually decreases, thereby producing a combined stream correspondingly varying in relative proportions of the component metals from the beginning to the end of the casting operation, and finally casting said combined stream to produce a product corresponding to the rate of flow.

729,755. APPARATUS FOR CASTING ALLOYS.—Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. In an apparatus for making alloys, a series of receptacles for molten metals, each having a metal-discharging outlet, means for gradually and simultaneously opening one outlet and closing the other during the discharge of the metals therefrom, and a rotary mold for receiving the metals discharged.

729,756. ALLOY CASTING.—Elmer Gates, Chevy Chase, Md., assignor to Theodore J. Mayer, Washington, D. C. An alloy casting, wherein the proportions of the component metals vary gradually and inversely from end to end thereof.

729,764. HYDRAULIC CLASSIFIER OR SIZER.—John F. Isbell, Denver, Colo., assignor of one-half to Otto Q. Beckworth and John N. Isgrig, Denver, Colo. In a hydraulic classifier or sizer, the combination of an upright casing having a funnel-shaped top, a valve-chamber below


729,764.

the funnel, a reduced part below the valve-chamber, an enlarged part below the reduced part, and another reduced portion below the enlargement, a tube located in said casing filling the reduced portions thereof, passing through the enlargement, and protruding into the valve-chamber, its valve-chamber extremity being outwardly flared or funnel-shaped, the said tube being open where it passes through the enlargement to allow the water to enter, its opposite extremity protruding from the casing, a supply conduit connected with the casing enlargement, a valve located in the valve-chamber adjacent the lower extremity of the funnel, the lower portion of the valve being surrounded by the upper extremity of the tube, the valve being provided with a stem passing downwardly through the tube which is large enough to allow the water to flow upward freely around the valve-stem from the casing enlargement, the valve-stem fitting the tube below the casing enlargement and protruding below the same, the tube and valve being adjustable vertically in the casing.

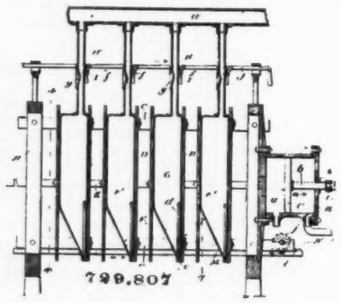
729,767. PROCESS OF MAKING HYDRATED CALCIUM PEROXIDE.—George F. Jaubert, Paris, France. A process of manufacturing hydrate-of-calcium peroxide, which consists in mixing in a dry state powdered slaked lime and hydrate-of-sodium peroxide and in thereafter subjecting the dry mixture to moist air free from carbonic acid until the mixture has slowly absorbed a small quantity of moisture without heating the mixture.

729,805. APPARATUS FOR EXTRACTING METALS FROM ORES.—John Stoveken, Cripple Creek, and Leo Stoveken, Florence, Colo. In an apparatus for extracting precious metals from their ores, means whereby ore is

reduced to a finely-divided or comminuted state in the presence of a solvent, a series of overflow-tanks arranged to receive the mixed ore and solvent from the reduction means; said tanks containing means for agitating the ore and solvent, and a filter arranged to receive the mixed ore and solvent from the last of the overflow-tanks, and adapted to separate the solution from the ore.

729,806. AGITATION-TANK.—John Stoveken, Cripple Creek, and Leo Stoveken, Florence, Colo. The combination of a tank having an outlet adjacent to its top, wings connected to and extending inwardly from the vertical wall of the tank, a conduit leading from a point adjacent to the bottom of the tank, and having a lateral opening adjacent to its lower end, a central vertical cylinder arranged in the tank, a piston movable in the cylinder, and having a rod extending through the upper head thereof, a gear disposed above the tank, and adapted to be connected by a driving connection with a motor, a shaft stepped on the piston-rod, and keyed to and adapted to move vertically through the gear, agitating means carried by said shaft, and comprising blades disposed below the wings.

729,807. FILTER-PRESS.—John Stoveken, Cripple Creek, and Leo Stoveken, Florence, Colo. In a filter-press, the combination of a bag having an inlet for material to be pressed, and also having a discharge-gate, means for

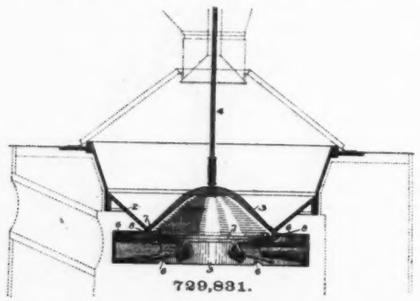


729,807

pressing the bag, and means for holding the gate closed while the bkag is being pressed.

729,819. APPARATUS FOR USE IN EXTRACTING METALS FROM ORES.—Jean F. Webb, Denver, Colo., assignor to Pneumatic Cyanide Process Company, a Corporation of Colorado. An apparatus for extracting metals by chemical process, the same comprising a tank provided with a filter-bottom, and a perforated pipe placed within the tank above and near the filter-bottom and connected with an air-supply device, said perforations being arranged to discharge the streams of air upon the bottom.

729,831. BLAST-FURNACE-CHARGING APPARATUS.—Albion P. Aiken, Port Perry, Pa., assignor of two-thirds to Michael Killeen and John F. Lewis, Braddock, Pa. In



729,831.

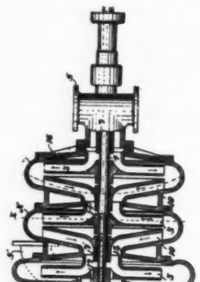
blast-furnace-charging apparatus, a vertically-movable bell having an outer annular deflector supported on the bell, with a space between the deflector and the side walls of the furnace.

729,867. HOISTING APPARATUS.—Charles W. Hunt, West New Brighton, N. Y. A hoisting apparatus comprising a trolley, a support therefor, a drum for raising and lowering the load, a drum for effecting translation of the load, a hoisting-rope passing from the first-named drum over the trolley to the load, a second rope passing from the second drum over an outer guide and connected to the trolley-frame, a single motor and means to couple either or both of said drums to said motor to rotate said drums separately or together.

729,868. HOISTING APPARATUS.—Charles W. Hunt, West New Brighton, N. Y. A hoisting apparatus, comprising a trolley, a support therefor, a shovel or bucket, a drum and rope for hoisting the shovel, a drum and rope for controlling the shovel or bucket, both of said ropes being wound on their respective drums in the same direction and passing over the trolley, means for driving said drums either separately or together, means for holding said drums from rotation, a third drum and rope for effecting translation of the load, the rope passing from said drum over an outer guide to the trolley and being wound on its drum in a direction opposite to the winding of the other two ropes on their drums, means to couple the third drum to one of the other two drums to rotate therewith, and means to hold the third drum from rotation.

729,869. HOISTING APPARATUS.—Charles W. Hunt, West New Brighton, N. Y. In a hoisting apparatus, the combination with a shovel, a hoisting drum and rope connected to the shovel, and a drum and rope for controlling the shovel, of electric motors separately connected mechanically to the several drums and arranged to be coupled electrically.

729,870. SERIES HIGH-PRESSURE CENTRIFUGAL PUMP FOR HIGH HEADS.—Byron Jackson, San Francisco, Cal. In a high-pressure centrifugal pump, the combination of an incased revoluble shaft, a runner upon said shaft, an annular space between the runner and the end of the casing adjacent to the discharge-passage, the latter



729,870

and said chamber being in constant communication, a passage connecting said chamber and the interior space of the runner, and a plug movable in relation to the end of the runner by which said passage may be controlled whereby the point of equilibrium of the runner may be varied arbitrarily.

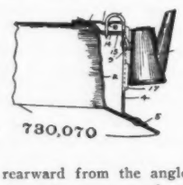
729,877. FURNACE CHARGING APPARATUS.—John F. Lewis, Braddock, Pa., assignor by direct and mesne assignments, of five-sixths to Michael Killeen, Braddock, Pa., and Albion P. Aiken, Port Perry, Pa. A blast-furnace having a charging-hopper with inwardly and downwardly converging sides, a bell arranged to close the lower end of the hopper, an annular deflector supported on and extending down from the hopper within the furnace-chamber, said deflector having converging sides with an annular space between it and the furnace-stack, and mechanism for moving the bell downwardly to a level below the lower end of the deflector to allow passage of lumps.

729,902. ELEVATOR FOR CASING AND TUBING.—John Scott, Oil City, Pa., assignor to Oil Well Supply Company, Pittsburg, Pa. In a casing or tubing elevator, the combination with a clamp comprised of a plurality of pivoted jaws and means for locking the same, of a plurality of included arc-shaped grip-blocks for each jaw, a retaining-pin for each grip-block, and a plurality of set-screws for each grip-block, said set-screws disposed on opposite sides of the retaining-pin of said grip-block.

729,939. APPARATUS FOR LIFTING STONE, ETC.—John Jones, Ashton-under-Lyne, England. An improved apparatus for lifting stone and other material comprising rising and falling arms suspended from the hook of the lifting-tackle, pivoted levers passing therethrough, a cross-bar to which the levers are pivoted carrying a screw for adjustment in relation to the stone to be lifted, levers pivoted to the side levers previously referred to provided with shoes or plates at one end to engage with the material to be lifted and at the other end with one or more toothed wheels or sectors and pivoted catch-levers operating in connection with the toothed wheels.

729,975. STONE-SAWING MACHINE. Charles A. Thomson, Belleville, N. J. A means for imparting to a saw-frame motion in a straight line, comprising a lever pivoted at one end to said saw-frame, a fulcrum slidably engaging said lever intermediate of its ends, and an auxiliary lever lying in the same general position as the main lever and having its outer end pivoted to the outer end of said main lever while its inner end is pivoted at a fixed point.

730,076. LAMP-HOLDER FOR MINERS' CAPS.—Cecil R. Anderson, Allegheny, Pa., assignor to Martin Hardscog Manufacturing Company, Limited, Allegheny, Pa. An improved lamp-holder comprising an angular support having

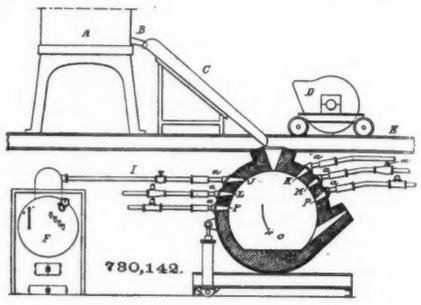


730,070

a top aperture rearward from the angle thereof, the top portion forward from the aperture adapted to be embraced by and sustain a lamp-hook which depends through said aperture, and a guide beneath said top portion having a backwardly and forwardly extending slot to receive the depending end of the hook.

730,121. UNLOADING MEANS FOR AIR-COMPRESSORS. Ebenezer Hill, Norwalk, Conn. In a multiple-stage compressor, the combustion with cylinders operating at different pressures, of an escape-valve controlling an outlet from the duct between the cylinders, a communication between the system beyond the high-pressure cylinder and said escape-valve, whereby the escape-valve is moved to open the outlet from the interduct when the pressure in the system beyond the high-pressure cylinder exceeds the predetermined maximum, and a valve controlling an opening into the high-pressure cylinder and adapted to be rendered inoperative by the drop of pressure resulting from the opening of the escape-valve.

730,142. PROCESS OF PURIFYING IRON.—Stephen L. Mershon, Montclair, N. J. A mode of purifying iron,



730,142.

consisting in subjecting the molten metal while in the form of a falling sheet or stream, and while in a furnace, to the action of a blast of wet steam.

730,162. SEPARATOR.—John Roger, Denver, Colo. In a separator, a main frame, a pair of supports, a shaft connecting the said supports together, a drive-shaft journaled in the said main frame and supports and adapted to support, operate and suspend the latter in the main frame, a screen carried by the said supports, and means connected with the said supports for adjusting them to various inclinations.

730,173. PUMP-ROD COUPLING.—Jacob L. Strawn, Jacksonville, Ill. In a pump-rod coupling, the combination of a pump-rod, a handle-lever fulcrumed intermediate its ends and having a slotted end bearing a cross-pin, a pivoted jaw mounted on said pump-rod, a fixed jaw located to cooperate with said pivoted jaw to engage said cross-pin, a lever having a slot therein engaging said pivoted jaw to operate it to couple and uncouple said pump-rod and said handle.

730,179. DUPLEX OR TWIN PISTON PUMP.—Ernst Vogel, Bitterfeld, Germany, assignor to Ortenbach & Vogel, Bitterbeld, Prussia, Germany. The combination, with two pumps each provided with a piston, a piston-rod, and a piston-slide secured on the said piston-rod and provided with lap, said pumps having also suction and delivery passages in common, substantially as set forth; of a separate engine for driving each said pump-piston rod independent of the other, and valve mechanism which constrains each said engine to move its pump-piston a prearranged part of its stroke while the pump-piston pertaining to the other said engine remains stationary.

730,195. METALLURGICAL FILTER.—John Stoveken, Cripple Creek, and Leo Stoveken, Florence, Colo. A filter comprising a frame having parallel ways at its upper side, belts having their upper stretches disposed in said ways, means for driving the belts, an endless filter-cloth interposed between and connected with the belts, and means for pressing pulp against the upper stretch of the filter-cloth.

730,210. SALT-BRINE EVAPORATOR.—Horace Holmes Kan. The combination of a covered pan, means for heating the same to produce therein evaporation from the surface at a temperature below the boiling-point, means for rapidly renewing the air above the surface of the brine and means for imparting the heat of the air and vapor driven out of said pan to the air before it enters the same.

GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

Week Ending May 16, 1903.

11,879 of 1902. BLAST-FURNACE CHARGING HEAD.—W. Crooke, Frodingham. An improved charging head for blast furnaces, with the object of preventing any gas escaping while charging.

13,245 of 1902. SPRAYING TANK FOR COAL MINES.—W. H. B. Stevens and J. Rhodes, Alfreton. A tank on wheels for spraying on coal mines.

23,612 of 1902. MINE CAGE.—J. Berry Wigan. An apparatus for transferring cars to and from mine cages.

840 of 1903. VENTILATING DOOR.—C. G. Diebold and J. M. Diders, Cleveland, Ohio, U. S. A. An improved ventilation door for mines with special method of opening and closing on the passage of a car.

1,410 of 1903. MINE MODEL.—N. R. Hill and J. R. Chamberlin, New York, U. S. A. A transparent mine model built up with sheets of glass.

TO ENGINEERS VISITING NEW YORK.

A room for the exclusive use of visiting mining engineers is maintained at the New York office of THE ENGINEERING AND MINING JOURNAL. Visitors to the metropolis are cordially invited to take advantage of the facilities it offers, by having their mail addressed in care of the JOURNAL and making its office their headquarters. The managers of the branch offices will also be glad to welcome visiting engineers and to be of any service to them that they can.

We are informed that the Institution of Mining and Metallurgy offers to all members of the American Institute of Mining Engineers non-resident in Great Britain, the privilege of free use of the Institution offices and library in Salisbury House, London Wall, E. C. Visiting engineers may have their letters addressed to the offices of the Institution and thus enjoy the advantages of temporary office accommodation in the city of London.

PERSONAL.

Mr. Arthur Winslow has returned to Denver from Arizona.

Mr. J. H. Curle is at Rome, Italy, taking a well-earned holiday.

Mr. L. S. Griswold, of Boston, Mass., has gone to Kingman, Ariz.

Mr. W. L. Austin, of New York, has returned from Cananea, Mex.

Mr. F. B. Vrooman, of Berkeley, Cal., is in New York City at present.

Mr. A. Spencer Cragoe, of Parral, Mex., sailed for London last week.

Mr. Andre P. Griffiths sailed from New York by the *Umbria* on June 6.

Mr. George E. Metz has been on a professional trip in southwestern Colorado.

Capt. W. Murdoch Wiley has returned to New York from Guanajuato, Mex.

Mr. Simon Guggenheim returned from Europe on June 9 by the *Kaiser Wilhelm*.

Mr. F. L. Bosqui is at Ross, Cal. He expects to open an office at San Francisco.

Mr. George E. Metz, of Brooklyn, N. Y., is examining mines at Telluride, Colo.

Mr. E. M. Rogers, of New York, has returned from an extended journey in Mexico.

Mr. W. G. Gaither, operating mines in Gifford County, was in New York City last week.

Mr. Herman A. Heller, of San Francisco, is now in New York on his return from Alaska.

Mr. Grant D. Miller has opened an office as cyanide specialist at 32 Broadway, New York.

Mr. Fred T. Greene is geologist on the staff of the Anaconda Copper Company, at Butte, Mont.

Mr. H. W. Spicer is superintendent of Hannan's Gold Estates at Kookynie, Western Australia.

Mr. Arthur R. Townsend, mining engineer, of New York City, is visiting Cripple Creek, Colo.

Mr. George B. Earnshaw, consulting engineer to the Nogales Copper Company, is in New York City.

Mr. G. B. D. Turner, manager of the J. I. C. Mine at Park City, Utah, left Salt Lake for Scotland on June 9.

Mr. O. J. Salisbury, manager of the Daly-Judge Mine, Park City, Utah, has returned to Salt Lake from San Francisco.

The German Chemical Society has conferred its Hofman gold medals on Prof. Henri Moissan and Sir William Ramsay.

Mr. Herman Hill, a prominent mining man and broker at Salt Lake, Utah, has gone to Germany for a two months' vacation.

Mr. Alfred Skeels, who has been looking after mining property in Gilpin County, Colo., has been making a business trip to Chicago.

Mr. R. H. Terhune, of Denver, is in New York City on professional business. His temporary address is Wood Ridge, N. J.

Mr. R. P. Hills, secretary of the Four Metals Mining Company, of Salt Lake, Utah, has gone to England on a business trip.

Mr. H. C. Bellinger is manager of the new smelter at Crofton, B. C., owned by the Northwestern Smelting and Refining Company.

Mr. C. N. Fenner, of the Engineering Company of America, sailed last week for Bolivia to investigate a number of gold properties.

Dr. L. A. Parsons, of Johns Hopkins University, Baltimore, Md., has been appointed assistant in physics at the University of Utah.

Mr. William M. Kerkhoff, of Minneapolis, Minn., is inspecting mines in which he is interested at Batamote, near Bonancita, Sonora, Mex.

Col. T. G. Bush, president of the Alabama Consolidated Coal and Iron Company, has gone to French Lick Springs, Ind., for a few weeks.

Mr. D. M. Bell, of Chicago, interested in the Orado Gold Mining Company, operating near Central City, Colo., was a visitor to the mines last week.

Mr. H. Johns has resigned as manager of the Sunset Mine of the Montreal & Boston Copper Company at Greenwood, B. C., and goes to Colfax, Wash.

Mr. R. A. Hadfield, managing director of Hadfield's Steel Foundry Company, Limited, Sheffield, Eng., sailed June 8 for home by the *Kronprinz Wilhelm*.

Dr. George Walter Stewart, instructor in physics at Cornell University, has been appointed assistant professor of physics at the University of North Dakota.

Mr. Andre E. Sayous, a French journalist and engineer, is touring the mining camps of Arizona and New Mexico in the interests of the Paris Board of Trade.

Mr. Edwin C. Holden, who is associated with the Engineering Company of America, has gone to Arizona to take charge of the mine of the Socorro Gold Company.

Mr. H. W. Cake, formerly assistant superintendent of the Calumet & Hecla mills, under Superintendent Coggin, has been appointed superintendent by President Agassiz.

Mr. A. B. Frenzel, of Denver, has been investigating the rare mineral resources of the San Juan Mountains in Colorado, and will leave shortly for a similar trip in Arizona.

Mr. W. E. Blakeslee has returned from Australia, where he was for 18 months in the employ of the Great Boulder Perseverance Company, and is now at North Chelmeford, Mass.

Mr. Blakemore, formerly superintendent of the Crow's Nest Pass Coal Company, operating at Fernie, Morrissey and Michel, B. C., has been appointed consulting engineer of the same company.

Prof. Alexander Graham Bell has resigned as president of the National Geographic Society at Washington, D. C., his resignation to take effect upon the election of his successor the coming fall.

Mr. Fred Dern has resigned as assistant secretary of the Consolidated Mercur Mining Company, of Mercur, Utah, to take a position with the Imperial Copper Company at Red Rock, Ariz.

Mr. F. M. Lockwood, of Franklin, Pa., who is interested in the Cashier Gold Mining and Reduction Company, operating near Central City, Colo., recently visited the property on his way to the Pacific Coast.

Mr. David S. Gregg, for several years on the engineering staff of the Salt Lake, Utah, branch of the Mine and Smelter Supply Company, has been promoted to manager of the El Paso, Texas, branch.

Mr. J. C. McShane, of Central City, Colo., has been making an Eastern trip in the interests of the proposed new railroad between Central City and Yankee Hill.

Prof. Koenig, of the Michigan College of Mines, is conducting experiments with the underground flow of water in the Quincy and Tamarack mines to determine if possible the origin of the Lake Superior deposits.

Mr. Lewis A. Darling, of the University of Nevada, has been appointed instructor in mechanical engineering in Leland Stanford University, taking part of the work of Prof. G. H. Marx, who goes to Europe on a year's leave of absence.

Mr. W. J. Lewis, for three years assistant to the president of the Sloss-Sheffield Steel and Iron Company, has tendered his resignation, effective June 15, and will return to his old home at Evansville, Ind., where he will engage in manufacturing.

Mr. A. E. Maccoun has been appointed master mechanic of the Carnegie Steel Company, succeeding Mr. J. F. Lewis. Mr. Maccoun has been in the employ of the company for about six years, coming to the Edgar Thomson Works from the Homestead Steel Works.

Mr. R. L. Lloyd, for several years foreman of the Boston & Montana Smelter at Butte, Mont., has been appointed general superintendent of the Greene Consolidated Copper Company's reduction works in Mexico, under Mr. Morrow, general manager.

Mr. Oscar Lachmund, formerly of Colorado, has been appointed superintendent of the Mina Reforma, Cienegas, Coahuila, Mex., with which property he has been connected for some time. It is one of the mines of the Gugenheim Exploration Company.

Mr. C. S. Herzig, mining engineer of New York City, having ended his contract with the Damara Land Syndicate, has left German Southwest Africa and is now making his headquarters temporarily in London. During June he will be occupied with professional work in Italy.

Mr. Percy Williams is now superintendent of the Silver Belle Mine, near Tucson, Ariz. Formerly he was with the Geyser-Marion Mine, at Mercur, Utah, later metallurgist at the Webster Mill at Marysvale, Mont., and recently he had charge of the Century Mill in Park Valley, Utah.

Mr. F. I. Cairns, formerly a smelter superintendent for the Anaconda Company, has been appointed superintendent of the new smelter to be erected by the Copper Range Company on Portage Lake, near Houghton, Mich. Mr. Cairns will superintend the construction. Mr. Frank Klepetko made the plans.

Mr. Fred Butler, who was for several years with the Consolidated Mercur Company, and recently was superintendent of the Chainman Company's property at Ely, Nev., resigned this latter position to become superintendent of the Utah & Eastern Company's copper mines, at Dixie, Utah, under Manager Beveridge.

Mr. George Bernard, who until recently was one of the largest stockholders in the Elkton Consolidated Gold Mining Company, has resigned as president and director, and has been succeeded by Dr. J. W. Graham. Both gentlemen were among the earliest large stockholders of the old Elkton Company before the consolidation.

Mr. Frank J. Buck, consulting engineer for the Las Vegas Copper Company, returned recently to Denver from a trip through Mexico. He has been appointed consulting engineer for the San Miguel Copper Company, which is erecting a 200-ton leaching plant, using Mr. Buck's electrolytic process of precipating copper.

The staff of Bewick, Moreing & Co., in Western Australia, consists of the following engineers: W. A. Pritchard, Bernard Kay, J. T. Hollow, H. A. Shipman, G. Lovell, J. A. Agnew, W. J. Loring, G. E. Bigelow, W. A. Barton, H. Stansfield, H. E. Vail and J. Allan; many of these gentlemen are well known in the United States, where they got their experience.

Dr. John H. Gower, of Denver, after a trip to England on mining business has been visiting mining interests in Gilpin County, Colo. On his last trip he was accompanied by Mr. W. P. Headen, a professor at the State Agricultural College at Fort Collins, Colo., who is manager of the Running Lode Mine, at Black Hawk, owned and operated by the Gower Mines Syndicate, Limited.

Mr. John A. Betjeman, a civil engineer of wide experience, is the third member of the faculty of the new engineering school of Colorado College, Colorado Springs, Colo. Next year he will have charge of the elementary and advanced work in surveying. Prof. Betjeman is a graduate of the Technical School of the University of Georgia, and studied civil engineering at Cornell University.

Mr. J. C. Maben, president of the Sloss-Sheffield Steel and Iron Company, who has been abroad for the past four months, is now returning, and should arrive in Birmingham about June 15 or 20. It is understood that he will go abroad again August 1 to spend the balance of the year. Vice-President J. W. McQueen is in full charge of affairs of the Sloss-Sheffield Steel and Iron Company.

Mr. C. I. Glassbrook has been appointed to succeed Mr. David L. Gregg as assistant to Mr. W. C. Bogue, manager of the Salt Lake branch of the Mine and Smelter Supply Company, of Denver, Colo. Mr. Glassbrook, until recently, was constructing engineer for the Park City Metals Company. He designed and superintended the construction of the Mollie Gibson Mill at Aspen, Colo., and also designed the Silver Lake concentrator, besides which he constructed three plants for the Batchelder Gold Mining Company, of Lake City, Colo.

Mr. J. F. Lewis has been appointed assistant superintendent of the Edgar Thomson steel works, blast furnaces and foundries of the Carnegie Steel Company, at Bessemer, Pa., succeeding Mr. Charles E. Dinkey, recently made superintendent in place of Mr. Thomas Morrison, resigned. Mr. Lewis has been in the employ of the Carnegie Steel Company about 27 years, working his way up from the position of machinist apprentice to machinist, draftsman, assistant master mechanic, master mechanic and finally to assistant superintendent.

OBITUARY.

George Parker, since 1883 partner in the well-known chemical and fertilizer firm of Peters, White & Co., of New York, and lately treasurer of the Mutual Chemical Company, of Jersey City, died of typhoid pneumonia on June 4, aged 45 years.

Walter B. Wilson, for 30 years identified with the Colorado mining industry, died at his home in Colorado Springs, Colo., on May 29, of spinal meningitis, caused indirectly by an acident three years ago at the Le Roi Mine in British Columbia. Mr. Wilson was

53 years old. He came to Colorado from Scotland in 1873 and was long engaged in mining in the San Juan region, having at various times been manager of the Silver Lake Mine at Silverton and the Yankee Girl Mine and National Bell Mine, near Ouray. He was manager of the Elkton Mine, Cripple Creek, 1897-1899, during its bonanza days. His record as manager of the Elkton gained for him the position of manager of the Le Roi Mine in British Columbia. He had an enviable record as a successful mining engineer, and among his wide circle of friends and acquaintances was respected and loved for his many sterling qualities. As a public-spirited citizen, he was ever alert and helpful, particularly in furthering the interests of the Cripple Creek District. He was one of the prime movers in the drainage enterprise for that district. He left a wife and four children.

Col. Joseph L. Beury, who died recently at Beury, Fayette County, W. Va., was a pioneer of the coal mining industry of the New River region. He was born in Schuylkill County, Pa., received a common school education, served in the civil war in a Pennsylvania regiment, and about 1872 went to West Virginia. He was manager of the New River Coal Company, which in 1874 shipped the first New River coal. About 1876, with associates, he opened the Fire Creek mines, and later leased and operated for a few months what was afterward the Gauley Mountain Coal Company's Ansted mines. Later, with associates, he developed and worked the Caperton Mine. In 1880, with others, he organized the Little Fire Creek Coal Company, that held valuable tracts of coal land. In 1898 the property of this company passed to the Echo Coal and Coke Company, in which Mr. Beury was interested at his death. In 1884 Col. Beury helped organize a company to work a lease in the Flat Top field, but sold his interests in 1889. In 1896 he opened the Chapman Mine at South Caperton, which he sold to the Chapman Coal Company in 1896. He was a director in the Beury Coal and Coke Company, the Buffalo Creek Coal Company, the Thayer Coal and Coke Company, the Hope Coal Company, the New River Colliery Company, the Little Fire Creek Coal Company, and a stockholder in many other coal mining concerns. He was one of the largest individual owners of coal lands in West Virginia. Col. Beury left a widow and four children.

SOCIETIES AND TECHNICAL SCHOOLS.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.—A laboratory devoted exclusively to research work in physical chemistry, is to be opened in September, 1903. The laboratory is to be under the directorship of Prof. Arthur A. Noyes, with Profs. H. M. Goodwin and Willis R. Whitney as associates, and a staff of research associates. The laboratory is to occupy one floor of a new building, and will consist mainly of a series of small laboratories, each with ample accommodation for two workers, and also a well-equipped machine shop, for making and repairing apparatus for investigation work. Rooms for special purposes, such as weighing, photographic work, glass-blowing, pure-water distillation, storage of chemical and physical apparatus, and the holding of lectures and seminar meetings, will adjoin the laboratories.

INDUSTRIAL NOTES.

The George V. Cresson Company, of Philadelphia, Pa., will soon ship a large lot of transmission machinery to Mexico.

The Allis-Chalmers Company, it is reported, will expend at the West Allis shops in Milwaukee the $1,000,000 which was recently set aside for improvements of the Chicago plant.

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The Witte Iron Works Company, of Kansas City, Mo., says that the volume of its business in May exceeded that of May, 1902, by at least 50 per cent.

The Gruson Iron Works of Eddystone, Pa., with Philadelphia office in the Penn Square Building, has changed its name to the Eddystone Foundry and Machine Company.

The United States Oil and Gas Well Supply Company, at Pittsburg, Pa., recently forwarded the last shipment of pipe and material for a water plant at Nome, Alaska. The plant is for a large mining company.

The Sterling Company, of Barberton, O., recently shipped 37 car-loads of boiler material to South Africa, for installation in mines. The New York office is in the Engineering Building, 114 Liberty Street.

The Toledo Portland Cement Company, of Toledo, O., has placed a contract with the Forest City Steel and Iron Company, of Cleveland, for structural material for the large cement plant it is erecting at Manchester, Mich.

The Mexican branch of the Mine and Smelter Supply Company, of Denver, Colo., secured a contract recently from the El Oro Mining and Railway Company for a complete high service pipe system. The pipe will cost about $50,000.

The Diamond Drill and Machine Company, Birdsboro, Pa., is making preparations to increase the melting capacity in its new steel casting department, and expects in a few months that it will be able to more than double the present capacity.

The Babcock & Wilcox Company is buying equipment for its new foundry at Bayonne, N. J. The foundry is to contain duplicate equipments, and is to have a capacity of 72 tons daily. The New York office of the company is at 85 Liberty Street.

The William A. Mead Manufacturing Company, New York office, Bowling Green Building, with plant at Rutland, Vt., will soon ship a large consignment of coal handling machinery for the Chelsea, London, S. W., power station of the Yerkes Underground Railroad.

The Stephens-Adamson Manufacturing Company, Aurora, Ill., says that the capacity of its works has been greatly increased during the last 60 days by the installation of additional machinery, and that never before was it in such good shape to take care of customers.

The Jeanesville Iron Works Company, manufacturing mine pumps, through its Denver branch has shipped to Mexico an electric power pump for 1,000 ft. lift. This is the last one of six ordered. It has also just shipped to Mexico a compound steam pump for 1,600-ft. lift.

The Sullivan Machinery Company, of Chicago, Ill., with New York City office in the Empire Building, has secured an order for drills to be used in prospecting work now being conducted in the Chanda District, India, on behalf of L. N. Tata, founder of the British Indian firm of Tata & Co.

The American Coke and Gas Company, of New York City, which was formerly known as the United Coke and Gas Company, is in the market for the equipment of two large gas producer plants, one at Johnstown, Pa., and the other at Duluth, Minn. Both plants are to be built according to the Otto-Hoffman system.

The Buffalo Steam Pump Company, with works at North Tonawanda, has been purchased by Messrs. William F. and Henry W. Wendt, who are also owners of the Buffalo Forge Company and the George L. Squier Manufacturing Company. The North Tonawanda Works of the Steam Pump Company are to be continued as heretofore, and the main offices will be in Buffalo.

The works of the National School Slate Company, of Slatington, Penn., have been equipped by the B. F. Sturtevant Company with complete heating and ventilating apparatus, using the hot-blast system. The air is drawn through a steam pipe heater by a fan, direct-connected to a horizontal, side-crank engine. The heater is built in five sections, one of which is designed to use the exhaust steam from the engine.

The American Diamond Rock Drill Company, of New York City, reports that it has recently sold several diamond drills to the Argentine Government. The Government having decided to develop and prospect mineral lands by the diamond drill, sent out an engineer to examine machines and methods of boring. After a trip through France, Germany, England and the United States the engineer gave an order to the American Diamond Rock Drill Company.

The Fairmont Steel Company, Fairmont, W. Va., recently organized with a capital stock of $100,000, is erecting a mill for re-rolling old rails, for mine use. The plant will be ready about November 1. Later the company intends to enlarge the works and to manufacture a variety of products. The officers and directors are John A. Clark, president; Clyde S. Holt, vice-president; W. J. La Follette, secretary; Walter Miller, treasurer; J. M. Hartley, T. J. Costello, John Phillips and George E. Miller.

An interesting example of the application of gas engines to Central Station service is afforded by the new plant of the Franklin Electric Company, Franklin, Pa. The gas power equipment will supplant a large steam plant, which the company has in operation, and will supply current for electric light and power service throughout the city. The present equipment comprises five 125-h.p. Westinghouse vertical 3-cylinder gas engines, which will be belted to a corresponding number of 75-kw. alternating-current generators. An interesting feature of the equipment is the provision made for the operation of the alternating-current generators in parallel. The plant operates upon natural gas fuel.

The Philadelphia Pneumatic Tool Company, of Philadelphia, Pa., reports a large increase in sales for May over any previous month this year. The demand for the Keller rotary drills and riveting hammers has been especially large, sales having been made to the Tennessee Coal, Iron and Railway Co., Great Northern Railway Company, Lake Erie & Western Railroad, Lake Shore & Michigan Southern Railway, Illinois Steel Company, Cambria Steel Company, Lorain Steel Company, Baldwin Locomotive Works, American Car and Foundry Company, American Bridge Company, Kilbourne & Jacobs Manufacturing Company, the Bucyrus Company, Camden Iron Works, Detroit Shipbuilding Company, New York Navy Yard and Mare Island Navy Yard, besides shipments to foreign countries.

TRADE CATALOGUES.

The Stephens-Adamson Manufacturing Company, of Aurora, Ill., in its bulletin No. 4, describes its belt-conveyor carriers, the pamphlet containing illustrations of some large conveying belts installed by the company.

Bulletin No. 35, a 16-page pamphlet published by the Browning Manufacturing Company, of Milwaukee, Wis., for which the Western Electrical Supply Company, of St. Louis, Mo., is general selling agent, describes the Browning motors, showing construction in detail and giving dimensions of the various sizes and types.

Catalogue A-29, published by August Mietz, of New York City, describes the Mietz & Weiss gas and kerosene engines. These engines are suitable for driving electric generators, or may be geared to a hoist or belted or geared to a power pump or to an air compressor or hoist. The fuel required for the gas engine is about 17 ft. per horse-power hour, and for the kerosene engine 1 pint of kerosene per horse-power hour.

The Cincinnati Milling Company ,of Cincinnati, O., publishes a 32-page pamphlet entitled "Examples of Rapid Milling." The illustrations and data in the pamphlet, taken from actual practice, show the class of work for which the Cincinnati geared-feed millers are adopted, and the rate at which they work. The illustrations show the company's machines for milling iron-castings, engine frames, slabs, steel castings, spiral surfaces, etc.

The Stilwell-Bierce & Smith-Vaile Company, of Dayton, O., has issued its general catalogue No. 55, which describes Smith-Vaile pumping machinery. The catalogue is a pamphlet of 116 pages, containing many fine half-tone cuts, illustrating those general types that are in general demand. The company's products include single pumps, duplex pumps, triple expansion pumping engines, compound pumping engines, vacuum pumps, hydraulic pumps, triplex power pumps, air compressors, etc. The company also manufactures the Victor turbine, the Stilwell improved feed-water heater and purifier and the Smith-Vaile filter presses. Tables giving much information of value to the engineer are included in the pamphlet.

Smeltermen and others interested in the briquetting of fine ores, flue dust, concentrates and other mineral fines will find useful information in an attractive 18-page pamphlet just issued by the Chisholm, Boyd & White Company, of Chicago, Ill. The pamphlet contains numerous fine illustrations, showing the construction and general appearance of the company's improved briquetting machine, and of its mechanical lime slaker and its conveyor mixer with automatic measuring device. The briquetting machine has a capacity of 8,000 3 by 2½-in. briquettes, or 5,000 4 by 2½-in. briquettes per hour. Slaked lime is generally used as a binder, but clay, sugar waste or other material may be used. Fines having some natural plasticity may need no binder. The pamphlet gives further general information on briquetting, and contains plans for a briquetting plant.

SPECIAL CORRESPONDENCE

Denver. June 9.

(*From Our Special Correspondent.*)

The Western Federation of Miners and the American Labor Union, which have been in session at Denver, both declared for Socialism; but it is said that there is a growing sentiment among the delegates, particularly from Montana, against the Socialistic propaganda of the two organizations. The convention of the Western Federation of Miners, by a vote of 125 to 20, on June 2 adopted resolutions which said in part:

"Political independence is a bauble and a delusion, while the toiling millions bear the yoke of wage slavery. No man among the vast army of laboring humanity can sucessfully assert his manhood, while his necessities make him a suppliant at the foot of another for a job.

"Capitalism can never be dethroned and wage slavery abolished until the natural resources of the earth and the machinery of production and distribution shall be taken from the hands of the few to become the collective property of all mankind.

"The principles enunciated by the Socialist party will make woman the queen of the home, and the child the bud and blossom of an emancipated generation."

The Western Federation of Miners also adopted a resolution empowering the Executive Board to call upon all unions of the organization to support a local union when necessary; thus the Executive Board is empowered to call out every union in its jurisdiction. This action grew out of the Colorado City strike that was settled, in a way, last March. At the time the Executive Board did not have the authority to call out the miners in the Cripple Creek district.

Governor Peabody's Advisory Board, consisting of Rev. Thomas A. Uzzell, of Denver; Frank W. Frewen, of Cripple Creek, and Father Joseph P. Carrigan, of Denver, which has been investigating the charges made by the Mill and Smeltermen's Union that the agreement by which the Colorado City Mill strike was settled on March 31 had been violated, has reported to the Governor, after hearing evidence and counsel on both sides, that Manager McNeill, of the United States Reduction and Refining Company, has used all possible efforts to re-employ the striking mill men, in accordance with his assurance made in March before the board. The officials of the Western Federation of Miners dissent from the report.

Mr. Lyman White, Colorado State Commissioner of Mines, has appointed mine inspectors, under the new law, by which the State is divided into three districts. Mr. M. J. McCarthy, of Victor, Teller County, will be inspector for District No. 1, including the counties of Teller, Fremont, Custer, Saguache, Rio Grande, Mineral, El Paso, San Juan, Pueblo, Huerfano, La Plata, Montezuma, Costilla, Conejos and Archuleta. Mr. H. A. Canning, of Aspen, Pitkin County, will be inspector for District No. 2, including the counties of Lake, Park, Summit, Eagle, Pitkin, Delta, Montrose, Mesa, Ouray, Gunnison, San Miguel, Dolores, Chaffee, Hinsdale and Garfield. Mr. G. W. Schneider, of Central City, Gilpin County, will be inspector for District No. 3, including the counties of Gilpin, Clear Creek, Boulder, Jefferson, Douglas, Weld, Larimer, Grand, Routt and Rio Blanco.

San Francisco. June 3.

(From Our Special Correspondent.)

Dutch Flat, on the line of the Central Pacific Railroad, in Placer County, was at one time famous for its extensive hydraulic mines, and all travelers by rail notice the devastating results of the work of the hydraulic giants on the surrounding hills. With the passing of hydraulic mining in that section, came the gradual but sure decay of Dutch Flat as a mining center and town, and now but a few miners eke out a living there. The citizens recently decided to organize a mining company to drift—not hydraulic—the remaining rich gravel beneath the buildings of the town. Hydraulic mining is not permitted except under restrictions which, locally, made it unprofitable. The gravel under the town is thought to be rich, and will pay well for drifting. Mining will be only to a height of 9 ft. above bedrock, under Dutch Flat and adjacent deposits, only the richer stratum being removed. The miners are to get $2.50 per day, $2 to be paid in cash and 50c. in stock of the company. When $500,000 has been paid out in stock wages are to be $2.50 in cash. Work is to start as soon as the company—the Golden Shaft Drift Company—is ready.

This is rather a novel enterprise. The old timers of Dutch Flat are sure of the richness of the gravel, and it is certain that many millions of dollars have come from the gravels in that vicinity.

On the last day on which parties in Shasta County could legally file protests in the Land Office against the issuance of patents to the railroad company for certain odd-numbered sections of the grants, only 31 protests, covering about 2,000 acres, were on file. The mineral claimants were to come in vast numbers and protest, but instead of any concerted action, it is apparent that only those directly interested in certain known mineral tracts made any protest, and probably the rest of the possible mineral lands in the odd sections of the county will go to the railroad company. The California Miners' Association tried for years to have all railroad grants classified so the domain of the prospector might not be curtailed by private ownership; but the railroad companies always succeeded in beating the Association in Congress.

The law relating to mineral lands in forest reservations is thus interpreted by the Commissioner of the General Land Office:

"The law provides that 'any mineral lands in any forest reservation which have been or which may be shown to be such, and subject to entry under the existing mining laws of the United States and the rules and regulations applying thereto, shall continue to be subject to such location and entry,' notwithstanding the reservation. This makes mineral lands in the forest reserves subject to location and entry under the general mining laws in the usual manner. Owners of valid mining locations made and held in good faith under the mining laws of the United States and the regulations thereunder are authorized and permitted to fell and remove from such mining claims any timber growing thereon, for actual mining purposes in connection with the particular claim from which the timber is felled or removed."

The old Gold Bank Tunnel on the South Yuba River originally started to drain the quartz mines of Nevada City and Grass Valley, was to be 7 miles long. After running some of the tunnel Francis N. Burns, of Nevada City, the prime mover, was forced to give it up. Now A. C. Van House, of San Francisco, is about to repair the old buildings and start work again. To complete the work will take about five years. The promoters expect to strike blind ledges and be paid by the mining companies for draining the mines, thus stopping pumping.

When the new Tonopah & San Francisco Mining Exchange was started in this city a few weeks since the stocks of a number of Mother Lode mines were called. The bids were as follows for Amador County Mother Lode properties: Argonaut, $4; Central Eureka, 90c.; Kennedy, $4; South Dakota, 25c.; Bunker Hill, $1.50; Wildman-Mahoney, $3; Gwin Mine Development Company, of Calaveras County, $8. The new Los Angeles Miners' Stock Exchange intended to trade only in those stocks representing mines which had been examined by experts of the Exchange, but as only about half a dozen or so qualified unlisted stocks were called, including securities dealt in at San Francisco, Salt Lake, Colorado Springs and other mining centers.

Spokane. Wash. June 4.

(From Our Special Correspondent.)

As a result of the fight which the big mines of the Coeur d'Alene are making against the new tax law, nearly all the dividend payers of the district are advertised by the sheriff to be sold for taxes, among them being the Bunker Hill & Sullivan, the Empire State-Idaho, the Tiger-Poorman, the Frisco Consolidated, the Golden Chest at Murray, the Hecla at Burke, the Mammoth, the Standard, the Gold Hunter and the interest of Kennedy J. Hanley in the Skookum. It is not believed that the properties will be taken from their present owners, but it is likely that the county will put the properties up for sale if the companies do not pay the taxes.

Patrick Clark, who has taken a bond on the Blue Ledge in Siskiyou County, Cal., for $250,000, has about a dozen men there under Superintendent John Bresnahan driving a lower tunnel. Larson & Greenough, owners of the Morning at Mullan, Idaho, are bonding there, as is Richard McKay, of the Mammoth. R. K. Neill, interested in the Finch & Campbell properties, is expected. Joseph Morris, the discoverer of the Le Roi at Rossland, is on the ground.

Howard Kressly, a young mining broker, has confessed to a series of stock forgeries and frauds that may reach $50,000. He was made secretary of the Lucille Dreyfus Mining Company, having a copper property at Danville, Wash., last December. The president of the company is W. M. Ridpath, formerly of the Le Roi. Kressly, after being made secretary, started forging stock wholesale. The legitimate stock certificates ran up to about No. 600. Kressly had a duplicate stock book running from No. 750 to 850, and forged Ridpath's name as president. His stubs show that he issued stock amounting to 320,000 shares, but admits that the stubs show only a portion of the frauds, and the illegal and forged stock may reach 800,000 shares.

Kressly sold much of the stock to E. S. Willard, of Wellston, O., who is believed to have over 300,000 shares of the forged stock. Kressly got loans from brokers in Spokane, putting up forged stock as security, at from 3 to 7c. per share. He also forged the names of Ridpath and E. D. Sanders to stock contracts for thousands more. Some of the stockholders who opposed Ridpath secured possession of the books this week, and when confronted with his frauds Kressly confessed everything. His confessions only make matters worse, and the affairs of the company are now in very bad shape. A receiver for the Dreyfus has been applied for.

Besides his forgeries of Dreyfus stock, Kressly is believed to have made way with Sullivan and Mountain Lion stock belonging to Col. Ridpath, in sums ranging from $10,000 to $20,000. The most remarkable thing about the case is that no one has yet appeared to prosecute him, and his friends say they believe him mentally unbalanced. No one can account for what became of his losses, though it is believed he speculated in Republic stocks and was caught in recent slumps.

The Sixteen to One case will come up for trial at this term of the Shoshone County, Idaho, District Court. The property has been estimated to be worth $750,000. The Finch & Campbell interests of Spokane are defending the adverse filed by Peter Berner. The case has gone up and down the courts, and was recently remanded by the Supreme Court of Idaho back to the Circuit Court because liquor was given the jurors at a former trial.

In the Coeur d'Alene the Reindeer Company has installed a Rand compressor on its property near Mullan. The old Duncan Mine, at the head of Trail Gulch, where a stamp mill has stood idle for years, is being developed again. The new gold dredge, which the Crysler interests have put on Trail Gulch, near Delta, has started up.

San Luis Potosi, Mex. June 2.

(From Our Special Correspondent.)

The Tula Iron Company, organized under the laws of New Jersey, purposes to mine iron ores in Mexico. The company is capitalized for $2,500,000 gold. It is believed the mines to be worked are in the State of Guerrero.

In Lower California J. A. Dubbs, near Ensenada, has deposits of sulphur, said to rival those of Popocatapetl, on which he has spent a large sum of money in development work, and from which he has just started to ship by way of Ensenada to 'Frisco. It is said his production can suply the demands of the Pacific Coast. A number of others who own valuable ground adjoining are allowing it to remain idle.

In Sonora the Zanbatic Mine, almost 200 years old, which is said to have paid $11,000,000 in royalties and taxes, is reported in bonanza, with ore running as high as $1,500 a ton in gold. A 40-ton mill is being erected to replace in part the former mill, which recently burned down just as it was ready to start. Near Moreno a new company with a capital of $1,500,000 has just been formed to work La Esmeralda Mine. A number of Chicago men, under the name of the Nogales Copper Company, have completed negotiations for the Cerro Prieto mines, about 40 miles from Magdalena, for which they are said to pay $600,000 gold. The property is reported to show a large vein of $6 free milling ore. The new company plans to erect a 100-stamp mill, and will endeavor to build a railroad from Magdalena to the property. At Minas Prietas, the Cerro Colorado, under the management of Frank Cox, has made some rich strikes and a part interest in the property has been bought by a French company on the reported basis of $10,000,000 gold for the whole. From the Cerro de la Compana, near Jerez, another rich gold strike is reported, and the American-Mexican Mining Company is opening ore in new territory near Caborca. At San Marcial the coal seams have proved to be so high in slate as to be of no commercial value, and the mines have closed down, throwing the burden of supply on the Barranca fields, where the work is pushed, and where also a good grade of natural coke is found.

Just south of Tampico, in the State of Vera Cruz, the Pan-American Company is prospecting for asphalt on the shores of Tamiahua Lake, all the way to Tuxpan; and other companies are searching on the banks of Tuxpan River.

In Oaxaca, Messrs. J. T. Franklin and H. M. Atkinson, of Waco, Texas, have bought some 20 pertinencias in the Zimitlan District, near Ayoquesco, about 18 miles south of Ocotlan, which they have called the Franco Mexicano. It is understood that negotiations are on again for the sale of the Natividad Mine, and a stockholders' meeting is called for this week.

In Michoacan a number of veins of good coal have been discovered between Marquez and Patzcuaro, near the terminus of the Morelia branch of the Mexican National Railroad.

At the Dos Estrellas Mine, in the State of Mexico, a number of car-loads of new machinery are expected, and an order is being prepared for an additional $350,000 worth. A 20-stamp mill is being erected at the Concepcion y Anexas. A large plant of machinery has been ordered for the Old Abe Mine, of Tlalpujahua.

In Queretaro, the Mina Grande Mining Company, working the Escamel and Bretano mines, in San Jose de Amoles, has made several new strikes. A good quality of coal is reported found in the district of Toliman, about 30 miles northeast of the City of Queretaro.

In Chihuahua, at Guadalupe y Calvo, W. A. Clark, after over a year of work and experimenting has, it is said, purchased the famous Rosario mines. The camp has been attracting attention some time, but is handicapped by lack of railroad facilities. From the Mexican Central the Naica Mining Company is preparing to build a road 20 miles to its mines. In Parral, the Iquana Mine has made a new strike; the Casualidad has been sold to Los Angeles, Cal., men, represented by D. M. Shanks; and Messrs. Dithridge and Burr have organized a company in New York, with $1,000,000 gold capital to develop several properties in Parral and Minas Neuvas. In Terrazes, Messrs. Boyce and Coupling, of Chihuahua, have bought the Maid of Erin and Shamrock, with a number of other claims; Felix McDonald has sold to J. W. McNeal, of Guthrie, Oklahoma, the San Salvador for a reported price of $100,000 gold, and the new company has already started work under management of E. W. Elliot. In the Pinetas Mountains the Hays Consolidated Mining, Milling and Lumber Company has started milling ore, and is building a road from its properties to Casitos.

Exchange on New York went during the past week from 233½ to 235, but there was no business to speak of.

Mining stocks showed a downward tendency. Monterey Iron and Steel sold at $103; Dos Estrellas, $2,350; Cinco Senores, $185; La Paz, Matehuala, $725; Candelaria de Pinos, $290; Providencia, San Felipe, Gto., $120; Soledad, $375; Sorpresa,

$313; San Rafael, Pachuca, $380; Esperanza, $1,350; Luz de Borda, $105; Amistad y Concordia, $75½; San Rafaeby Anexas, $1,040. Victorio y Anexas, a new company, of El Oro, was most in demand, going up to $200 for $100 par shares, with only $30 paid in.

London. May 30.

(*From Our Special Correspondent.*)

The meeting of shareholders in Stratton's Independence, Limited, was held this week, and a very prolonged and noisy one it was. As I mentioned in my last letter, the report of the company for the year ended June 30, 1902, had only just been circulated, and contained very little information of use at the time of issue. The chief point round which discussion at the meeting centered was the proposition of the directors to keep in hand the £144,000 undistributed profit. This proposition was strongly opposed, and the meeting was eventually adjourned to give the directors an opportunity of altering their policy and of bringing in a modified proposal for dealing with these profits. It appears probable that a 5 per cent dividend will be eventually decided on, absorbing £55,000; but many shareholders think that 10 per cent should be distributed. Another point on which shareholders wanted information was the present amount of ore in sight, but as Mr. Hammond was not at the meeting no definite statement or opinion was forthcoming, and the discussion degenerated into personalities. Several shareholders drew attention to the fact that a year ago it was supposed that the mine was worked out and that the remaining ore to be stoped would not last many weeks; whereas the mine has continued shipments, and the end is not yet. A great deal of dissatisfaction was also shown when it was discovered that the undivided profits are being used for stock exchange purposes instead of being placed in some standard investment. No doubt the money is being used with due caution, but as the failure of a firm would wipe it out promptly, it is not quite the best way of using the money. At the adjourned meeting these matters will all be discussed over again, and perhaps the directors will see fit to place the money in a more suitable way.

The Sao Bento Gold Estates, Limited, one of the Brazilian mines managed by Messrs. John Taylor & Sons, shows signs of arriving at prosperity before long. The property was first acquired in 1897, and on several occasions additional capital has been found necessary. After some vicissitudes in the manner of treating the ore, the dry crushing and cyaniding plant is now working well, and the extraction is satisfactory. The average assay during 1902 was 7 dwts. 4 grains, and the extraction 6 dwts. 15 grains, or 92 per cent of the assay value of the ore. During the year, 36,600 net dry tons were treated, yielding 12,176 oz. of fine gold. The profit earned was £14,934, but during the year additional expenditure to the amount of £12,645 was charged to capital account, the items consisting of £4,800 for driving and sinking, and £7,800 for plant and buildings. The mining superintendent, Mr. James Miller, has shown considerable apititude in reducing costs all around. One of the difficulties encountered at this mine is the great scarcity of fuel. The cost of wood is very great, amounting to 2s. per ton of ore treated. The directors now propose to adopt water power, electrically transmitted, for the purpose of driving the plant, and this is the chief reason why I refer to the company's doings in this letter. Messrs. John Taylor & Sons have been extremely successful in the substitution of electric transmission of power from waterfalls in connection with their Indian mines, and a similar scheme in Brazil is of considerable interest. In this case the distance to be transmitted is much less than in India, being only 9.5 miles from the Pity Fall on the Santa Barbara River. The available horse-power of the fall is 1,300. In order to provide the necessary capital debentures are to be issued, carrying 10 per cent interest, and eventually redeemable or convertible into preference shares. When this installation is completed the company should be earning profits, as the extraction plant works well, and the mine is opening up large bodies of ore.

The evil results of the Klondike craze have not yet drifted into the obscurity of the past. One by one, however, the Klondike companies are disappearing. The latest to go is McDonald's Bonanza, Limited. This was floated in 1899 to acquire claims from Alexander McDonald. The purchase price was £410,000, payable £55,000 cash, £20,000 in preferred shares, and £335,000 in ordinary shares. The total capital was £450,000, divided into 335,000 ordinary shares and 115,000 preferred shares. The public subscribed for about 70,000 preferred shares, of which the bulk went to the vendor and about £15,000 for working capital. The total return out of this has been two dividends amounting in all to 17.5 per cent. The directors now find that it is no use continuing to work the property, and impossible to find a new one. It is proposed to wind up the company and distribute the assets, which amount to about £12,000. This is a sorry ending to a company which promised such great things. I have the original prospectus before me. It states that the estimate of the value of the gravel deposits amounts to £1,379,288, and that the cost of working and recovering the gold would not amount to more than 10 per cent of its value. It also states that the gentleman who is responsible for these estimates is interested in the purchase consideration. The reason for the wide discrepancy between the estimate and actual results is no doubt to be found in this fact.

I have several times recently referred to the Nile Valley Company and its scheme of reorganization so as to obtain further capital from Mr. J. B. Robinson, of Rand fame, and from its present shareholders. It will be remembered that, according to the reorganization scheme approved by the Egyptian Government, present shareholders were to subscribe for one new share at par, £1, while those issued to Mr. Robinson would be issued at 30s., according to the agreement made when the first reorganization scheme was evolved. The anomaly of a different price was more apparent than real, for the subscription by the present shareholders was in the nature of an assessment on their holdings. Mr. Robinson, however, objected to the arrangement, as I reported in my last letter. Subsequent negotiations have been an entire failure, and now Mr. Robinson has finally backed out of the deal. The directors state that this action of Mr. Robinson constitutes a clear breach of the agreement, but they do not intend to take any action to enforce it. Consequently the company now stands where it did three months ago, and the reorganization scheme has been abandoned for the present. The directors and shareholders could have well afforded to issue 50,000 shares at par to Mr. Robinson instead of 32,000 at 30s. each. The exact eventual value of shares in a development company can never be gauged, and the price at which they are issued depends entirely on the relative views of the two parties concerned. To throw away Mr. Robinson's offer, which, after all, was a liberal one, showed considerable want of business tact. Perhaps, however, the fact that the reorganization scheme involved an assessment on present shareholders, which was not contemplated originally, has made the directors not very keen on enforcing Mr. Robinson's agreement, or coming to some other terms with him.

GENERAL MINING NEWS.

Chesapeake & Ohio Railway Company.—Coal and coke shipments in April and the 10 months of the fiscal year beginning July 1, 1902, were as below, in short tons of 2,000 lbs.:

	April.	Ten mos.
Coal:		
New River	309,864	1,880,322
Kanawha	179,327	986,193
Kentucky	14,105	106,129
	503,296	2,972,644
From connections	10,127	145,633
Total	513,423	3,118,277
Total, 1902	498,974	4,823,351
Coke:		
New River	38,674	263,811
Kanawha	13,841	72,173
	52,515	335,984
From connections	1,243	3,509
Total	53,758	339,493
Total, 1902	47,257	409,920
Grand total	567,181	3,457,770
Grand total, 1902	546,231	5,233,271

The decrease in the current 10 months is due chiefly to the smaller shipments of New River coal to tidewater points.

CALIFORNIA.

AMADOR COUNTY.

Argonaut Mining Company.—The directors have decided to postpone the reopening of this property at Jackson until next year. It has been closed down some time, owing to litigation with the Kennedy and the unsettled condition of labor.

Bunker Hill.—Owing to some defect in the title of the mill site, erection of the mill at Amador City has been delayed.

Plymouth Consolidated Mining Company.—A judgment has been obtained in the Superior County Court settling the title in Alvinza Hayward, Hobart Estate Company and Charles D. Lane, of the mines and ditches, formerly owned by this company, a New York corporation.

Vaughn.—Work is to be started by Charles A. Marener on the Champion Mine, near Jackson, formerly called the Vaughn.

BUTTE COUNTY.

A plant will be established near Lovelock to grind about 1 tons a day from the mineral paint deposit of about 300 acres. The new railroad of the Diamond Match Company will pass close by.

CALAVERAS COUNTY.

Boston.—Work has been commenced on this mine, also known as the Esperanza, near Mokelumne Hill.

Central Hill.—High grade ore is being taken from this mine at Central Hill, operated by M. and D. A. Nuner, of San Andreas.

Ellen Vannen.—This gravel mine in Old Woman's Gulch, near Mokelumne Hill, has been taken by a company, with Willard C. Mead as manager, and will be unwatered and retimbered.

Highway Mary.—This gravel mine, on Tunnel Ridge, has been bonded by Daniel Black and the Ratto Brothers to a Nevada company.

Jenny Lind Dredge.—Men are at work preparing a site for the dredger in the Calaveras River bottom, near Jenny Lind.

Maltman Gold Mining Company.—This company owns the Great Western, Great Eastern and Perlina mines at Angels. James G. Maltman is superintendent.

Mauna Brothers Mine.—This mine, near Jesus Maria (Mokelumne Hill), has been bonded by B. K. Mauna to an Eastern company for $8,000, and a 2-compartment shaft is to be sunk. B. K. Mauna will be superintendent. A road is being built to haul in machinery.

Rooney Gravel.—This mine in Chile Gulch is showing up well.

EL DORADO COUNTY.

Sunshine and Lee.—These mines at Greenwood have been sold to H. Anderson, of San Francisco, it is said, for $15,000.

FRESNO COUNTY.

Copper King Mining Company.—Henry C. Tupper, as assignee of a number of this company's employees, at Clovis, has sued to foreclose their liens, making as co-defendants with the mining company all the firms and companies having claims against it.

INYO COUNTY.

Enterprise.—J. T. Wyatt and J. M. Heiskell are opening this property at Pine Mountain. New trails have been recently built into this section.

KERN COUNTY.

At Indian Creek, 15 miles from Caliente, a mill, small smelter and cyanide plant are to be erected. The Amalie and Zada mines have been shipping their ores.

Echo.—This mine at Mohave has 20 stamps operating, and is putting in a cyanide plant.

Exposed Treasure Mining Company.—This company, near Mohave, is running 20 stamps and a 70-ton cyanide plant.

Johannesburg Gold Mining Company.—This property in Randsburg District is owned by Senator Stephen W. Dorsey, A. Chapele and E. Morrison. Considerable development work is being done, two shafts are being sunk, and a 10-stamp mill will soon be running.

Karma Mining Company.—This company, near Mohave, is installing a 20-stamp mill, and will soon put in a cyanide plant.

Mammoth Coal Mining Company.—This company is operating a coal mine, near Garlock, and has recently installed a gasoline engine and blower.

Queen Esther.—This mine, near Mohave, is putting in Cornish rolls to crush its ore previous to cyaniding.

MADERA COUNTY.

Jessie Bell.—It is reported that this mine has been bought by men from Los Angeles, who intend putting up a smelter.

MARIPOSA COUNTY.

Washington and Number Nine.—These mines, at Hornitos, W. F. Stevens, superintendent, are being started up again, power being transmitted from the recently purchased plant of the Nameless Mining Company.

Whitlock District.—The Imperial Mine, at this camp, is showing some good ore. The Egenhoff property on the Merced River has been sold to men from Spokane, Wash. Work has been commenced on the Triumph by Helm & Czerny.

MONO COUNTY.

Golden Gate Mining Company.—The stamps have commenced dropping at this mine, near Colevill. A large supply of ore is on hand.

MONTEREY COUNTY.

Los Burros District.—Mr. Spencer has bonded several claims, including those adjoining the Grizzly on the east. Some coarse placer gold is being taken out on Dogvine and Spruce creeks. The post office is Jolon.

NEVADA COUNTY.

An 8,000-ft. 24-in. pipe line is to be laid from the South Yuba reservoir on Banner Ridge to Union Hill to increase the water supply of the Empire, Brunswick and Union Hill quartz mines at Grass Valley.

Work has been commenced on a 1,200-ft. tunnel at Blue Tent, under supervision of C. J. Graham.

Boss Extension.—At the extension to the mine at Sweetland, it is intended to erect a mill.

Central Consolidated Gold Mining Company.—This new organization, Oscar Coflin superintendent, has bonded the Central and Greenhorn mines four miles east of Grass Valley, and will commence work at once.

Water is to be brought from the South Yuba reservoir. The 10-stamp mill will be repaired, and the machinery run by water power. The mines were formerly producers, but have been idle for sometime.

La Belle.—This mine, near Nevada City, has been secured by San Francisco men, and will be worked.

Murchie Mining Company.—This company, near Nevada City, J. C. Campbell superintendent, has leased the Texas Mill, its own having been burned some time since. The Murchie is an old mine, which is being reopened.

ORANGE COUNTY.

Silverado Mining and Milling Company.—Los Angeles and Long Beach men have purchased the Dunlap Mine, near Orange, and will also work the Silverado and Silver King mines. Frank Porter is superintendent.

PLACER COUNTY.

Barton.—J. B. Hanna has purchased cars, rails and other supplies for this mine, near Westville, and has 20 men getting ready to reopen the property.

Golden Shaft Drift Company.—This company has been organized to drift the gravel deposits under the town of Dutch Flat. The directors are Ed Mallows, J. L. Gould, A. Ferguson, J. M. Barney and Robert Munroe.

PLUMAS COUNTY.

Johnny Bull.—On this mine, near Greenville, a cyanide plant has been installed. The mine is under bond to Droege Brothers, of Kentncky.

McKill & Standard.—This mine, near Greenville, has been bonded by New York men, through W. D. Lawton, of San Francisco.

New York.—This mine, near Greenville, owned by J. D. Whitney, of Philadelphia, is now well equipped and is shipping bullion. Another mill will be added this fall.

SAN BERNARDINO COUNTY.

(*From Our Special Correspondent.*)

Waterloo Mining Company.—This Company, at Dagett, recently sold its big silver mill to Hofius, Chamberlain & Co., of Los Angeles. The mill contains 72 stamps, 27 amalgamating pans and everything that goes to make up a complete plant. The original cost was over $150,000. The new owners will either move it to another place or offer it for sale.

SAN DIEGO COUNTY.

Golden Cross.—This mine, at Hedges, owned by the Free Gold Mining Company, cleaned up from its cyanide plant $10,191 in April and $5,652 from its mill. The expenditures were $13,393, including a third payment to the trustees.

Stonewall.—The buildings, saw mill, etc., at this mine at Cuyamaca, Col. S. H. Lucas superintendent, are being put in order for resumption of work. This mine was formerly a producer, but has been idle some years.

SHASTA COUNTY.

Gold Hill.—At this mine, on Slate Creek, near Lamoine, W. C. Weirich superintendent, men are busy.

Balaklala.—At this copper mine, near Kennett, about 50 men are employed and a number of buildings are being erected.

SIERRA COUNTY.

Tabor Gold Mining Company.—At this mine, near Gibsonville, A. F. Eaton superintendent, the tunnel is in 3,600 ft., and gravel has been reached by a 42-ft. incline. The company owns 5,000 ft. of the gravel channel. An electric power plant is to be installed.

SISKIYOU COUNTY.

B. A. Cardwell, who has bonded for Eastern men the hydraulic claims of J. S. Lowden, Jr., at Hamburg Bar, has gone East to arrange for their development. A 14-mile ditch to bring in water from Scott River is one of the improvements contemplated.

Ball.—Woodfill & Co. are working over the tailings of this mine at Eddys Gulch, near Rollin, and obtaining the sulphurets by means of a canvas plant.

Consolidated Mining and Dredging Company.—It is reported that this company, at Callahans, has bonded its claims and apparatus to Eastern men, who will work the property on a more extensive scale.

Scott.—This mine, on Indian Creek, is again running full handed, the strike among the miners being over.

Willard Eastlick.—At this claim at Oro Fino, owned by a Tacoma company, pumps must be put in before further sinking can be done.

SONOMA COUNTY.

Sonoma Quicksilver Mining Company.—This company has commenced burning 300,000 brick for its new furnace at Pine Flat.

TULARE COUNTY.

Nieman-Showers.—At this gold mine, near Porterville, the shaft is down 125 ft. in rock of good grade.

TRINITY COUNTY.

Chloride Mining Company.—This company, at Dedrick, is getting good ore from the Chloride-Bailey, and is running 30 stamps.

Ralston.—On this mine, at Dedrick, George L. Bailey has struck the ledge on the lower level, and has started his two-stamp mill.

TUOLUMNE COUNTY.

Clio.—Operations have been resumed on this mine at Jacksonville.

Little Bonanza.—At this mine, at Sonora, about $20,000 has been taken from a rich pocket.

YUBA COUNTY.

The United States Government engineers will resume work at once on the first Debris Barrier, at Daguerre Point, on the Yuba River, and construction of Barrier No. 2 will begin this summer.

C. L. Crane, of Camptonville, has shipped in a lot of machinery for a dredger to be operated on the Middle Yuba River, near that place.

Smethurst.—The George Smethurst mine, near Browns Valley, is being pumped out, and a force will be put to work.

COLORADO.

CHAFFEE COUNTY.

Salida Gold and Copper Mining Company.—This company has ordered six 24-in. Wallace sectional steel crushers for its new copper leaching plant, near Salida. These crushers are to take the place of rolls. The mill building will be ready about July 20. E. B. Green is manager.

CLEAR CREEK COUNTY.

Centennial.—A rich strike is reported in the sixth level of this mine on Leavenworth Mountain, at Georgetown. The ore was opened at about 800 ft. depth in virgin ground, and carries values in gold, silver and copper.

EL PASO COUNTY.

United States Reduction and Refining Company.—The Supreme Court of the District of Columbia has dismissed the appeal of the Economic Gold Extraction Company in regard to the Mosher filter. The decision, it is understood, gives the United States Company the rights to all points in dispute.

GILPIN COUNTY.

(*From Our Special Correspondent.*)

Gilpin Ore Shipments.—The shipments of smelting and crude ores, tailings and concentrates, from Black Hawk depot during May were 265 cars, or 2,300 tons, an increase over former months this year, due to shipments from outside districts. Indications point to increased shipments. The Golden Smelter is to resume during this week. Good news to many of the lower grade smelting properties.

Cook.—Sinking has begun with three shifts and Sullivan air drills. The shaft, down 900 ft., will be sunk 500 or 550 ft., making it 200 ft. deeper below the Bobtail. The ores hoisted are to be handled through the Bobtail tunnel level from where they will be taken by electric tramway to the big mill on North Clear Creek. The new work is being carried out by the trustees representing the Boston & Denver Consolidated Mining and Milling Company, but the leasing work and pumping arrangements are under the direction of the receiver. In the meantime, the operators will change the steam plant to electric plant. About 50 men are at work, O. B. Thompson, Black Hawk, has been appointed manager with W. H. Davis as superintendent.

Gilpin Tramway Company.—The annual election of stockholders was held in Central City June 2, when the following directors were selected: George E. Randolph and J. W. Bostwick, of Denver; Robert E. Sloan, of Durango; L. Hanchett and W. L. Bush, of Idaho Springs; T. H. Potter and Frederick Kruse, of Central City. The newly elected officers are: President and chairman of directors, W. L. Bush; vice-president and vice-chairman, J. W. Bostwick; secretary, treasurer and general manager, Frederick Kruse. The company has increased its mileage, has had a very prospecous year, and during the balance of this year will extend its lines to other shipping mines.

GUNNISON COUNTY.

Colorado Mines Consolidated Company.—This Cripple Creek company has resumed work on its property in the Cochetopa District. The tunnel on the Standard and Sterling lodes is in over 1,000 ft. A large body of low-grade ore is reported opened, and the company expects to keep its stamp mill running.

Jersey Blue.—The 25-ton cyanide mill at Ohio is running. The pneumatic cyanide process is used.

Old Lot.—The stamp mill, near Spencer, is to start soon, to treat the low-grade ore of the Old Lot Mine. The high grade is being sacked and shipped to the smelter.

Somerset.—These coal mines, near Somerset, operated by the Rio Grande Railroad, are producing about 300 tons daily. It is reported that the company will soon put in coke ovens.

LAKE COUNTY—LEADVILLE.

(*From Our Special Correspondent.*)

Leadville Ore Output.—May was the banner month of the year in tonnage, the production being 79,000 tons of all classes of material.

A. V.—This new property at the foot of Harrison Avenue is closed on account of a legal tangle between the Morocco and Home Extension companies.

Big Six Mining and Leasing Company.—The capital stock is $100,000. Directors are J. C. Ross, W. S. Copeland, S. H. Finley, E. L. Ogden and D. A. Shinnick. The property is on Breece Hill, and large bodies of siliceous ores are exposed.

Blue Ribbon.—Sinking has stopped, and two drifts are being run in virgin ground.

Bohn Mining Company.—At the annual meeting on June 4, A. Sherwin, of Leadville, and Messrs. Goff and Brazee, of Denver, were elected directors. It was decided to resume work in the near future on downtown territory, controlled through the Bohn shaft.

Caribou.—George Campion is shipping about 150 tons of iron ore daily from this property. The iron body is a wonder, and will net $4.50 to $5 a ton.

Fanny Rawlings.—The lanphier lease on the Rawlings has made a good find through a new shaft at 135 ft. The vein shows 3.5 ft. wide, and it is a heavy lead ore, carrying silver and gold.

Iron Silver Mining Company.—Rail connections are to be made between the old Moyer and new Moyer shafts. The former is outputting 300 tons daily of good iron ore. Preparations are being made to increase the output.

Izzard.—Lessees on this Little Ellen Hill property have opened a good body of lead and siliceous ores, believed to be the continuation of the New Year and Little Ellen shoots. Assays are favorable.

Martin Leasing Company.—In Dewey section, on the Raven property, this company, at 75 ft., has opened a fine vein of high-grade ore. Samples from a 6-in. streak are reported to run over $500 a ton, while the company is sinking on rich ore in a new shaft. At the Keystone property arrangements are being made to go 300 ft. deeper.

Midas Mining Company.—Work is pushed on the drift toward the Coronado, and when it is completed shipments of 130 tons a day can be largely increased.

Morea.—In virgin territory on this old Fryer Hill shaft, Parker & Co., after months of development work, have cut a large iron body that run 60 per cent excess and 10 oz. silver. The ore-body has been opened extensively and 1,000 to 1,500 tons will be shipped this month.

Mosquito Range Mining Company.—The capital stock is $400,000. The directors are Charles A. Walker, John A. Ewing, Owen Wherity, M. J. Dailey and Oliver Allen, who, with R. R. Rowles, are the incorporators of the new company, which, it is understood, plans important operations.

Ohio.—This downtown mine, idle for some time, is to be operated by lessees.

Progressive Mining Company.—Manager W. L. Cooper states that the Cady has a number of new drifts all in ore, while several hundred tons of ore have been shipped from the rich body found some months ago.

Sixth Street.—Local lessees, headed by Charles Osgood, are shipping 75 tons a day of manganese iron and also are opening up some better material in virgin ground. In one of the new iron bodies a vein of fine looking carbonate has been cut. The manganese nets $2.75 a ton.

Valentine.—The annual meeting of the company was held this week. The company is out of funds and work has stopped for the present.

LAS ANIMAS COUNTY.

Colorado Fuel and Iron Company.—The total output of this company's coal mines in this county during May was 210,327 tons, an increase of 2,500 tons over the best previous month's production. The coke output was 74,023 tons.

SAN MIGUEL COUNTY.

Carribeau-Montezuma.—This group, near Ophir, has been, according to T. F. Artell, manager, purchased outright for cash by the Yellow Mines Company, of Ophir. The officers are: E. K. Austin, president; W. H. Thomas, consulting engineer; William Davidson, superintendent, and T. F. Artell, general manager. The New York office is 82 Front Street.

San Miguel Consolidated Gold Mining Company.—The North American Exploration Company states that it has not sold the Nellie and Ella mines in Bear Creek to the above company, or to any concern or persons, and the San Miguel Consolidated Gold Mining Company has no interest whatever in the Nellie and Ella properties.

TELLER COUNTY—CRIPPLE CREEK.

(*From Our Special Correspondent.*)

Geological Survey of Cripple Creek.—All the money subscribed in this State for the re-survey of this district is now in two local banks, subject to the order of the State geologist, who has charge for the State. The work of leveling has already begun, and the topographers are expected to arrive about June 15. It

is understood that Mr. Lindgren, who is to have charge of the geological work, will be on the ground about July 1.

C. K. & N. Gold Mining Company.—The recent rich shipments from this Beacon Hill property amounted to 1,551 lbs. of ore of the value of $19,189, or about $12.38 per pound. This is one of the richest shipments made from the district. The property is worked under lease by Horace Granfield and associates, who are making continuous shipments of good ore. The company has paid three dividends of about $15,000 each from the royalties received, and now has about $18,000 in the treasury.

Cripple Creek Enterprise Gold Mining Company.—The large gallows frame is finished, and the new hoist and air compressor are being installed. The shaft is down about 200 ft., with some drifting done. It is reported that the shaft is to be sunk another 300 ft. at once.

Elkton Consolidated Gold Mining Company.—From all reports this property is looking very well. A strike was recently made in the Tornado property by some lessees. It should develop into a good thing. The lessees' ground does not extend much below where the strike was made, so the company intends to work the continuation of the shoot. No work is done on the bottom level on account of the water, but work will be resumed in this level as soon as the drainage tunnel is completed.

Little Bessie.—Considerable development is in progress on this Beacon Hill property, which is equipped with a good hoisting plant and compressor. The property is near the El Paso and the C. K. & N. properties. Charles Wyncoop, of Anaconda, has charge.

Mary McKinney Mining Company.—This property is reported producing about $75,000 per month, though the bottom level is under water. The ore comes from all over the mine. No attempt is made to work the sixth level, as the drainage tunnel will begin draining the property before long. The property is near the Anaconda, and has the reputation of having the longest ore shoot in the camp. George Keener, of Cripple Creek, is in charge.

Portland Gold Mining Company.—This company is putting in a large compartment air compressor at shaft No. 2, and erecting a new house. The compressor is said to be the largest in the district. The new tramway for disposing of the waste is running satisfactorily.

Stratton's Cripple Creek Mining and Development Company.—The report that has been brought up a number of times of late with regard to the sale of this property to an Eastern syndicate, is denied. The granting of leases on different blocks has been put off from time to time, and now it is not known when the ground will be leased. The company owns a large area on Bull, Globe and Gold Hills, and also in Poverty Gulch.

Stratton's Independence, Limited.—The mine produced last year 96,1[illegible] tons ore of the average value of about $23.56 per ton. The treasury reserve is about $750,000. The mine is at present going along as usual and putting out considerable medium grade ore.

IDAHO.

BANNOCK COUNTY.

Pocatello Gold and Copper Mining Company.—A strike of high-grade copper ore is reported having been made in this company's Moonlight Claim on Rabbit Creek, 10 miles east of Pocatello.

NEZ PERCES COUNTY.

Crackerjack.—On this property, at Buffalo Hump, the 5-stamp mill is reported turning out about $4,500 a month. The company has ordered five additional stamps to be installed early in August.

SHOSHONE COUNTY.

North American Mining and Milling Company.—This company, operating a group of 11 claims on Bug Creek, east of Wardner, filed articles of incorporation recently. The capital is $1,500,000. The incorporators are: John Presley, president; Thomas Fahey, Timothy Fahey and Alexander Murphy, of Wallace, and Alice Fahey, of Burke.

Standard.—Two car-loads of machinery for the electric pumping plant to be installed in this mine, near Mace, arrived recently. The pumps are to be at the 1,000-ft. level. The shaft is 3-compartment. A large force is employed. Electric power will be obtained from the Washington Water Power Company, which is running a line from Spokane.

(From Our Special Correspondent.)

Standard and Mammoth.—Ex-Senator Turner, of Washington, has secured an option on these properties in the Coeur d'Alene until August 18. The option is rumored to be for $2,500,000 cash, and is supposed to be in the interest of Charles Sweeney, of the Empire State-Idaho Company.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

Rhode Island Copper Company.—At the annual stockholders meeting held recently, the old board of directors was re-elected. James L. Bishop was elected vice-president in place of C. H. Mason, deceased.

(From Our Special Correspondent.)

Arcadian.—Rock shipments to the stamp mill at Grosse Point have stopped, and the head is closed. Work at the Douglass shaft will be continued, a small force being employed sinking. Diamond drill work continues, as a large part of the company's territory remains to be explored.

Baltic.—The May production was 688 tons of mineral.

Centennial.—At this mine sinking in A shaft has been resumed at 2,600 ft. There are now 3 miles of openings on the Kearsarge amygdaloid.

Champion.—This mine produced 691 tons of mineral in May. The mill is treating nearly 1,500 tons of rock daily, and Dr. D. L. Hubbard, the superintendent, estimates that sufficient ground is opened to supply 4 heads for 20 years. The 4th head will go into service in August, when the new 100-drill compressor should be completed.

Copper Range Consolidated.—It is reported that this company will shortly begin work on a smelting plant west of the old Atlantic millsite on Portage Lake. It will be at the mouth of Cole's Creek on the property recently purchased from the Atlantic Mining Company. F. I. Cairns, formerly superintendent of the Anaconda Smelter, will have charge of construction and operation. Frank Klepetko, of New York, has prepared the plans.

Franklin.—No. 1 shaft, on the Allouez conglomerate lode at the Junior branch, is sinking below the 16th level. The stamp mill is treating 1,125 tons of rock daily, 750 tons from the Junior branch and 375 tons from the old mine. The May production was 371 tons of mineral.

Old Colony.—Work is confined to a cross-cut west from the bottom of No. 1 shaft at a depth of 580 ft. Two amygdaloids opened with a diamond drill will be explored.

Osceola Consolidated.—A contract for the erection of 40 dwelling houses at the North Kearsarge branch has been awarded.

Quincy.—This mine produced 1,043 tons of mineral in May.

Winona.—Drifting south from No. 2 shaft at the 3d level has been resumed. No. 3 shaft is opening by raising from the 4th level south of No. 2 shaft.

Wolverine.—The May production was 514⅛ tons of mineral.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Ahmeek.—The cross-cut, east from the exploratory shaft, has encountered the Kearsarge amygdaloid lode at 140-ft. east of the shaft. A few months ago the lode was cut with a Highland jumper drill at a vertical depth of 215 ft.

Allouez.—The new 3-compartment shaft is down 25 ft. in sand. Work on a boiler house, 50 by 29 ft. and 14 ft. high, and an engine house is under way. A battery of two 125-h.p. Burt locomotive firebox boilers will be installed. A duplex Fraser & Chalmers friction clutch straight face drum hoist, good for a depth of 2,600 ft., has been purchased from the Centennial Copper Mining Company, and will be installed.

Mohawk.—The output for May was 379.5 tons of mineral.

COPPER—ONTONAGON COUNTY.

(From Our Special Correspondent.)

Hamilton.—This exploration is the farthest west of the Michigan properties now working in the copper district. It is being developed by the Copper Crown Mining Company, of St. Louis, Mo., which is driving a tunnel into a high bluff to open various lodes at a good depth. The more promising ones will be developed. Capt. John Finnigan, of Ramsey, Mich., is in charge.

Mass Consolidated.—A skip road has been completed to the 3d level in C shaft, on the Butler lode, and a small amount of rock is hoisted daily. A duplex Nordberg hoisting engine purchased from the Arcadian Consolidated Copper Company, has been installed. Transportation facilities will be afforded by a mile extension of the Mineral Range tracks.

Michigan.—Washington fir for the new shaft and rock houses at A and B shafts has been delivered and the structures are progressing rapidly. Several segments of the conical drum for the new hoist at A shaft have arrived from the Webster, Camp & Lane Company, of Akron, O. Shaft A is down 1,575 ft., and B shaft 1,675 ft. A winze is sinking from the bottom of B shaft to cut the West vein. Twelve power drills are in commission.

WAYNE COUNTY.

Michigan Rock Salt Company.—Work is soon to be resumed on the shaft of this company's mine at Le Moyne, in Ecorse. A reorganization has been effected with J. M. Mulkey as president; Ralph Loveland, vice-president; John A. Russell, secretary; O. W. Mulkey, treasurer, and C. A. Black as one of the directors. The new organization, it is said, will absorb the Mulkey salt block on the River Rouge. A contractor has been engaged who guarantees to sink the shaft to the first body of salt at about 800 ft.

MINNESOTA.

(From Our Special Correspondent.)

Although ore shipments started later this year than last, shipments from Minnesota show no decline. Other ranges show a falling off. The general feeling is that shipments this year will not be heavier than last, that there may be a slight decline, More ore was carried down in 1902 than was needed, and many causes combine to restrict shipments this year. Sales of non-bessemer ores are frequent, but Mesabi bessemers are worked off slowly. The difference in price between the two grades is so marked with so little actual difference in analysis that Mesabi non-bessemers are bought and mixed with old range low phosphorus ores, the whole going into the furnace as a bessemer mixture. Other causes as shown by market reports are effective in checking buying. Just now shipments are very heavy, chiefly from United States Steel Corporation mines and from those of outside interests who sometime ago sold a guaranteed 64 per cent low phosphorus west Mesabi ore for a term of years at $2.75, Cleveland delivery. On such sales as this buyers are eager that contracts shall be carried out to the last pound. At many mines stock-pile shipments are very heavy, but mining is conservative. This is true not only of the Mesabi but of all other ranges, and in some cases the force employed in summer mining has been cut down.

There is no decrease in the number of drills at work on the newer ranges. Explorations are also starting in other new districts, not only on the American side, but in Canada, Pickands, Mather & Co., have just started two drills west of Port Arthur, Ont., and both American and Canadian interests, steel makers as well as speculators, are working in that general region. There has been some talk of exploration on the west end of the Penokee Range, in Wisconsin, but little is under way there. Considerable work is under way, and more is planned for parts of the Marquette Range, especially on the formation running west from the Fitch and neighboring mines, also near the Swanzey Mine, where some ore is being opened by a large independent company. There will be a large amount of money spent this year on the ore-bearing formations running from Ishpeming toward Michigamme Lake.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

The sale of the one-half of the southeast quarter of section 6, T. 57, R. 20, to men represented by D. M. Philbin, manager of the eastern division of the Great Northern road, is being closed. The option was taken under a showing of 1,500,000 tons of non-bessemer ore, running better than 53.50 per cent iron. The explorations made by the option holders doubled the showing. The price is a $40,000 bonus in cash and 10c. royalty, besides the 25c. the State receives as fee holder. The State's minimum is 5,000 tons annually, while that to the original lessees, on their 10c. a ton, is 100,000 tons a year, thus making a $11,250 ground rent annually. A year ago the property was not considered especially attractive, being rather remote.

It is stated that ore has been found at a point six miles south of Grand Rapids, on the Mississippi River, and that the Mesabi formation has been cut there. As to the truth of this assertion nothing can be learned.

Nearly 100 ft. of reasonably fair ore has been cut by a drill in the n. e. of n. s. of section 24, T. 57, R. 22, where J. P. Morrow and others have been at work some months. Mr. Morrow is taking other lands in the vicinity.

Explorations in section 21, T. 59, R. 14, that were heralded as of great promise, have not proved up, and the land will probably be abandoned. The ore was mixed, like much of what is found in the same neighborhood.

Longyear Lake, covering about 160 acres in section 21, T. 58, R. 20, part of which is in the ore-bearing formation, has been in controversy between the State and owners of shore rights. The State is now to give a lease for exploring purposes, claiming it has the right, and work may commence there shortly. It is not at all certain that ore exists under the lake. A series of holes along its south edge, sunk by Messrs. Congdon, Hartley, Longyear and others have shown nothing.

Messrs. Sweeney, Miller, Hartley and Crosby are exploring in sections 23 and 24, T. 57, R. 22, with four drills, and have some 4,000,000 tons in sight, of a reasonably fair grade. In 23 the ore is under a rock capping from 75 to 125 ft. thick. The last hole went through 101 ft. of ferruginous chert before cutting ore, but the ore is of better grade than most in that district. These are State lands, and will pay

$1,000,000 to the school funds on what ore is now in sight.

Operations in the south half of the northeast quarter of section 22, T. 58, R. 15, are discontinued, no ore being found. On the adjoining forty south, the northeast of the southeast, work is under way, and a small tonnage has been shown. A large amount of work is going on near the Croxton Mine, on the east side of T. 58, R. 20, but ore-bodies found are small, and may not prove up. Recent explorations on the Croxton have shown over 6,000,000 tons.

Three churn drills are claimed to be working on the so-called Highland "Range," but nothing has been found but dirt and boulders. Duluth assayers are getting many samples of quartzite, diabase, gabbro and even clay, in which optimistic explorers hope there may be sufficient iron to make a showing.

MONTANA.

In May the Helena assay office received $184,958 in gold and $870 in silver, a total of $185,828, as compared with a total of $153,402 for May, 1902. Of the amount for May Montana mines contributed $162,451.

CARBON COUNTY.

(From Our Special Correspondent.)

Clarks Fork Placers.—Some good prospects in the gravel along this river have recently been discovered by T. C. Sherril and Ed. Chaffin, of Red Lodge. The pay gravel is found about 8 ft. below surface. Four nuggets amounting to $72 in value were found in one pit. The actual result with a rocker has been $6 per day to the man. A gold dredge put in some four years ago was not a commercial success.

DEER LODGE COUNTY.

(From Our Special Correspondent.)

The old brick stacks built on the top of the mill back of the old smelters of the Anaconda Company, and connected with the works by long brick flues, are being blown down with dynamite. The brick from them is used in the stack and flue being erected at the new Washoe Smelter. There were seven of these stacks, each 200 ft. high.

Palmer.—F. G. Brown, of Anaconda, is preparing to ship to the Butte smelters 100 tons daily of iron ore to be used as a flux. The average iron excess of this ore is better than 50 per cent.

Washoe Smelter.—The estimated amount of copper produced during May is 13,500,000 lbs. This record is said to be far ahead of any reduction works in existence.

FLATHEAD COUNTY.

(From Our Special Correspondent.)

Snowshoe.—This property in the West Fisher District has resumed work after being idle most of the past winter, owing to an excessive fall of snow. The concentrates from the mill will be shipped to the smelter at Everett, Wash.

FERGUS COUNTY.

(From Our Special Correspondent.)

Kendall.—The stockholders in this property have received notices that hereafter the monthly dividend will be $20,000. Heretofore the amount declared has been $15,000. The net earnings are said to be about $30,000 a month.

GRANITE COUNTY.

Copper State and Red Metal.—These two properties, bonded last fall by A. D. Fraser and W. J. Quinn to George Kirby and other New York men for $60,000, are being developed by a small force. The development consists of 400 ft. of tunnels ,and a 100-ft. shaft; a lead showing good copper values has been cut. Ernest Denton has charge for the New York men.

JEFFERSON COUNTY.

Buckeye.—Work is to be resumed on this mine, in Jack Creek District, 12 miles north of Basin.

Silversmith.—This mine, near Basin, is worked under lease and bond by D. J. Sweeney. Shipments are made regularly.

(From Our Special Correspondent.)

Comstock.—This property, 4 miles from Basin, has been leased and bonded to William Kidney and Al. Ray, of Basin. Machinery is to be installed at once.

Liverpool.—This property, under the management of Ed Eyle, of Clancy, has the main shaft below 700 level. Sinking will continue to 800 ft., where a crosscut will be driven to the lead. During 1893, '94 and '95 this mine produced $500,000 in silver.

Rocky Bar.—Three cars a week of shipping ore are sent to the smelter. A mile ditch is under construction to bring in water for concentrating the second-class ore. Martin Mulverhill, of Helena, is manager.

Silversmith.—D. J. Sweeney, of Basin, is working this property under a bond. The pay streak is from 6 ins. to 2 ft. wide. The ore shipments average from $150 to $225 per ton.

MADISON COUNTY.

Pacific.—This mine employs about 25 men. The mill started recently on a one-shift run, and will work full time as soon as sufficient water can be obtained.

MISSOULA COUNTY.

Log Cabin.—This group of four claims, adjoining the Monitor-Richmond, is owned by W. W. Hart, of Wallace, Idaho, and Michael Hayes and Mr. Heidenreick, of Saltese. Fifteen men are employed.

Monitor-Richmond.—This property on Silver Creek, near Saltese, is developed by three shafts 500 ft. apart on the Richmond, and drifts run from the 200-ft. level. Last year a plant costing $10,000 was installed. It is reported that a Scotch syndicate is negotiating for this property. The Monitor group consists of 10 claims adjoining the Richmond, and has made some rich shipments of copper-gold ore. It is reported that negotiations are pending for the erection of a smelter near Saltese. The original owners of the Richmond are C. J. Heidenreick, Otto Hill and Burt Hill, of Saltese, while the Monitor group is held by Mr. Heidenreick, H. E. Curtis and Horace Kimball ,of Spokane.

Tarbox Mining Company.—About 16 men are employed on this company's Tarbox lead-silver mine, on Packer Creek. A new hoist has been installed. The 200-ft. main shaft is to be sunk to 450 ft., and the company may erect a concentrator during the summer. Richard Daxon, of Wallace, Idaho, is president and manager.

SILVER BOW COUNTY.

Alice Gold and Silver Mining Company.—The annual report filed recently with the County Clerk, states that the capital stock is $10,000,000, all paid in by the purchase of property. The assets comprise 17 patented mining claims; a 60-stamp mill, a 20-stamp mill, hoisting works and mining machinery, all in Walkerville, and of a cash value of about $75,000. The liabilities are about $6,000. The report is signed by M. H. Walker, president; L. H. Farnsworth, secretary, and T. W. Buzzo, agent.

United Copper Company.—At the annual meeting held recently in New York City, the following directors were elected: F. Aug. Heinze, A. P. Heinze, Jacob Langeloth, John Maginnis, F. W. Whitridge, G. Reusens, S. E. Nash, A. A. Brownlee and Hugo Blumenthal, who takes the place of Henry Budge, of Hallgarten & Co.

(From Our Special Correspondent.)

Pennsylvania.—Judge Harney has made an order in the case of the Montana Ore Purchasing Company against the Boston & Montana Company, restraining the employees of the latter company from making powder smoke in the underground workings of this mine, to the alleged annoyance of the former company. The order to show cause is set for June 21.

NEW MEXICO.

SAN MIGUEL COUNTY.

American Consolidated Copper Company.—This company is producing about 60 tons daily from two shafts on its Atwood claim in the Shakespeare mining district, near Las Vegas. The company, it is said, intends installing a leaching plant for the low-grade ores. The smelting ores are shipped to the El Paso Smelter.

PENNSYLVANIA.

BITUMINOUS COAL.

Pittsburg Coal Company.—This company has purchased about 300 acres of coal land, known as the Caldwell tract, in the northern part of Washington County. The consideration was $82,000.

Seger Coal and Coke Company.—Prominent lumbermen of Pittsburg and vicinity have just completed the organization and incorporation of this company, having secured something over 6,000 acres of valuable coal and timber lands in Indiana and Westmoreland counties. Part of this property is heavily underlaid by an 8-ft. vein of the Pittsburg seam, while still other portions contain good deposits of the upper and lower Freeport and Kittanning seams.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Crown Mica Company.—This is one of the oldest mica mines in the Black Hills, and was worked in the early days. Recent work has uncovered several good bodies of mica not previously known.

North Star Mining Company.—A discovery of good ore is reported on the North Star group, about 9 miles from Custer. The North Star has a 20-stamp mill on the claims. The company is experimenting on processes for getting better extraction.

Saginaw Mining Company.—A small force has been employed during the past six months. Work has been retarded by a controversy among the Eastern stockholders. A series of experiments is being made by Lee G. Hoyt, the company chemist, to ascertain the best means of treating the ore exposed.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Gold Eagle Miinng Company.—The following are officers: Richard O'Neil, Lincoln, Neb., president; C. Y. Smith, Lincoln, Neb., vice-president; Dr. G. M. Smith, Lincoln, Neb., secretary; J. P. Hymer, Deadwood, treasurer; John Hawgood, Terry, general manager; J. C. Noland, Maitland, superintendent. The company has taken over 130 acres of mineral land, near Maitland, adjoining the property of the Penobscot Mining Company, and owned by J. C. Noland, J. P. Hymer, John Hawgood and others.

Hidden Fortune Mining Company.—A. H. Danforth, formerly with the Colorado Iron and Fuel Works, and later with the Guggenheim, has been elected general manager. The cyanide plant, near Deadwood, is making a trial run. The mill is expected to be turned over to the company some time this month. The old hoist at the Bingham shaft, destroyed by fire in March, is being replaced with better machinery, and sinking is to be resumed. The shaft house has been delayed by non-arrival of mill timbers from Oregon.

Horseshoe Mining Company.—The board of directors, at a meeting in Milwaukee, elected E. M. Holbrook president, and decided to retain W. L. McLaughlin, of Deadwood, as general manager. Mr. McLaughlin has had many years' experience in South Dakota.

UTAH.

Ore and Bullion Settlements.—Salt Lake banks report settlements for the week ending June 5 as follows: Ores and concentrates, $129,200; base bullion, $142,000; gold bars, $56,800; total, $328,000.

BEAVER COUNTY.

(From Our Special Correspondent.)

Beaver Consolidated.—The flow of water is increasing in the 2-compartment shaft being sunk. J. J. Trenam, of Salt Lake, is manager.

Cactus.—Local officials have plans completed to start work of installing a 1,000-ton concentrator and smelter near the mine. Samuel Newhouse is expected to arrive in Salt Lake by June 15.

O. K.—The new shaft has been completed to 225 ft. The Durkee drills recently installed are giving satisfaction.

Royal.—Orders have been placed with Fairbanks, Morse & Co.'s Salt Lake house for 6 gasoline engines and 6 hoists, to be delivered before September 1.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—Shipments from the Tintic District for the week ending June 5 aggregated 132 carloads, as follows: Centennial-Eureka, 25; Carisa, 3; Bullion-Beck, 4; Black Jack, 1; Dragon Iron, 18; Gemini, 12; Eagle & Blue Bell, 3; Grand Central, 17; La Clede, 1; Lower Mammoth, 5; Mammoth, 23; Star Consolidated, 5; Victor Consolidated, 3; United Sunbeam, 1; Yankee Consolidated, 11.

Carisa.—The management has settled for a shipment of ore on a basis of 25 per cent copper; another averaged 44 per cent copper, bringing the company about $4,000.

Galena.—The new hoist, replacing the one burned recently, is in commission.

Garrison Gold and Copper Mining Company.—This company is completing patents for part of its Deep Creek property.

Grand Central.—Air drills have been installed.

May Day.—The new concentrator, now building, will be ready soon after June 15, says Manager Alviras E. Snow, of Salt Lake.

Star Consolidated.—Stoping ore is in progress on the 300 level, and will soon be on the 400. Fifteen feet of shipping ore is reported disclosed in these stopes.

Uncle Sam.—At the stockholders' meeting, held in Salt Lake, on June 2, John Dern, James Chipmen, B. F. Saunders, William H. McIntyre, of Salt Lake, and George Havercamp, of Eureka, were elected directors. Between July 14 last year and June 1 this year the company marketed 3,029 tons of ore, netting $15.53 per ton, or $47,188. The gross receipts were $62,570. It is estimated there are 200,000 tons of ore blocked out in the mine. The company has above $12,000 in its treasury. John Dern is president; James Chipman, vice-president and manager, and W. S. Chilman, secretary.

SALT LAKE COUNTY.

The copper bullion output of the Salt Lake Valley smelters in May was 3,061,845 lbs., the Highland Boy Smelter, 1,015,000 lbs.; American Smelting and Refining Company, 960,000 lbs.; Bingham Consolidated, 603,000 lbs.; United States, 482,845 lbs.

Bingham Consolidated.—Copper bullion shipments this week were 245,000 lbs.

Boston Consolidated Mining Company.—At a meeting of the American directors of this company in New York recently the number of directors was increased

from three to five, Messrs. E. E. Abercrombie and F. A. Schirmer, of Boston, being the two new directors. Mr. Abercrombie was elected vice-president and Mr. Schirmer treasurer.

Columbus Consolidated.—Preliminary surveys have been completed for the proposed electric power plant and concentrator. High-grade ore is shipped.

Consolidated Jefferson.—This company, operating in Little Cottonwood Canyon, near Salt Lake, has obtained control of the New State Mine adjoining. A new hoist has been installed. W. B. Windsor and S. B. Tuttle, Salt Lake, are the principal Utah shareholders.

Tintic Mining and Development Company.—Ground has been broken for this company's Yampa Mine smelter at Bingham.

United States Smelter.—Copper bullion output for the week were 2 cars, 120,263 lbs.

Utah-Apex.—This company has absorbed the York and Copperfield mines in Bingham. It is capitalized for 500,000 shares of a par value of $1 each, under the laws of the State of Maine. The officers are: President, E. W. Hastings, Boston, who, with Everett B. Webster and W. J. Carlin, of Boston, and A. J. Orem, of Salt Lake City, constitute the board of directors. Walter C. Orem, of Salt Lake, is manager. The London representative is Reginald Ward, of Clark, Ward & Co.

Utah Consolidated.—This corporation, the New American concern, organized under the laws of New Jersey, has absorbed the Highland Boy Mine, of Bingham. The Highland Boy Gold Mining Company is no longer in existence. Manager R. H. Channing has returned from a conference with the directors with instructions to go ahead with the proposed enlargement of the smelter, the capacity of which will be nearly doubled. It now handles 515 tons per day. Copper shipments this week were five cars, or 30,500 lbs.

Wheeler & Wilson.—This property in Big Cottonwood district has its shipment of 40 sacks of fair grade ore ready. E. W. Kelley, of Salt Lake, is one of the principal shareholders and a director.

SUMMIT COUNTY.

(*From Our Special Correspondent.*)

Park City Shipments.—Shipments for the week ending June 5 were 4,920,000 lbs., as follows: Silver King, 1,859,000 lbs.; Daly West, 3,002,000 lbs.; Comstock, 59,000 lbs.

Daly West.—The directors have declared a dividend of 60c. per share. During May 5,560 tons of ore and concentrates were shipped to smelters. Employment is furnished to about 500 men.

Minola.—The winze is completed to 415 ft. A. H. Mayne, of Salt Lake, is manager.

St. Louis-Vasser Mining and Milling Company.—This company has been organized to develop a group of four claims in the Snake Creek District, near Park City, adjoining the Wolverine. The capital stock is 300,000 shares of $1 par. The incorporators are: Michael Shaunnessy, president; Robert Gorlinski, vice-president; J. R. Walker, secretary and treasurer, who, with J. C. Lynch, James A. Miner, M. A. Hughes and James Hogle, constitute the board of directors. On the property is a vein of ore exposed from 18 ins. to 3 ft. wide, carrying values in gold, silver, copper and lead. All the incorporators live at Salt Lake.

WEST VIRGINIA.

MARION COUNTY.

Powell Coal and Coke Company.—This is the name of a new company just chartered, with a capital of $300,000, for the purpose of developing a tract of 6,000 acres of coking coal on the Tygarts Valley River, between Grafton and Fairmont, on the main line of the Baltimore & Ohio Railroad. A plant of 200 ovens will be built at once, and the contract for the brick and other materials has been let. The men interested in the Powell Company own 5,000 acres of coal land adjoining, and are the chief stockholders in the Valley Falls Coal and Coke Company, which has 1,200 acres of coal land adjoining the last-named tract. This company has 30 ovens turning out coke.

M'DOWELL COUNTY.

Rock Cliffe Coal and Coke Company.—This company, recently organized with a capital of $200,000, will open mines at Keystone to mine coal on a large scale and also to manufacture coke by a new process. The members of the company are J. F. K. Steele, of Keystone, W. Va.; J. D. Herwitz and F. R. Herwitz, of Bramwell, W. Va.; J. C. Pack, of Freeman, W. Va., and W. C. Stephenson, of Roanoke, Vt.

WISCONSIN.

SAUK COUNTY.

Illinois Iron Mining Company.—This company is the principal operator in the iron fields near North Freedom and Baraboo. The stockholders are chiefly the same as those of the Deering Harvester Company, of Chicago. The property is being explored with diamond drill.

Iroquois Iron Company.—This Chicago company, in which M. A. Armour, William A. Rodgers and Geo. A. Tripp are interested, has been exploring its property in the Baraboo District.

Wisconsin Iron Mining Company.—This company, of which B. C. Dean is president; H. H. Thomas, secretary, and M. L. Patterson, treasurer, is developing iron ore deposits near North Freedom.

FOREIGN MINING NEWS.

AUSTRALIA.

TASMANIA.

Mt. Lyell Mining Company.—This company reports for the four weeks ending April 29, the quantity of ore smelted was 22,021 tons, the yield being 450 tons of black copper, containing 444 tons fine copper, 46,843 oz. silver and 1,661 oz. gold. The averages were 2.02 per cent copper, 2.83 oz. silver, and 0.075 oz. silver to the ton.

CANADA.

BRITISH COLUMBIA—BOUNDARY DISTRICT.

Boundary Shipments.—The shipments for the week ending May 30 were: Granby, 4,779 tons; Mother Lode, 4,557; Snowshoe, 1,680; B. C., 810; Emma, 360; Sunset, 396; total for the week, 13,082 tons; for the year, 213,981 tons.

Athelstan Gold and Copper Mining Company, Limited.—Work has been resumed on this company's Athelstan Mine, about 3 miles from Phœnix. The property formerly shipped to the Granby and Boundary Falls smelters, but has been idle for two years. The ore is arsenical iron, carrying gold and a little silver. David Oxley is foreman. The company has a capital of $50,000. The officers are James Anderson, president; John Mack, vice-president, and W. J. Morrison, secretary-treasurer.

Nellie Cotton and Mystic.—These two properties, near Phœnix, close to the Ironsides and Knob Hill mines, were bonded recently by Hal Cole to J. E. Everhart, W. D. Everhart and Max Sands, all of Chicago. The purchase price was not stated, but a first payment of $10,000 on the bond is reported made.

BRITISH COLUMBIA—NORTHWEST KOOTENAY DISTRICT.

Horseshoe.—This property, at Trout Lake, is reported acquired by Philadelphia parties for $16,000, with a first payment of $5,000, the balance to be in two payments of $5,500 each on October 1 next and April 15, 1904. The deal was put through by G. W. Stead, manager of the Ethel and Lucky Boy.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

White Bear.—This company intends installing a 20-drill compressor and a 125-h.p. hoisting plant at a cost of about $20,000, and erecting buildings for the same. Work on the plant is to begin this summer.

NOVA SCOTIA.

Richfield Mining Company, Limited.—This company, we are informed by John W. Regan, secretary-treasurer, was recently organized in Halifax, and most of the directors are Halifax business men.

ONTARIO—HASTINGS COUNTY.

Belmont.—The capacity of this gold mine is to be largely increased during the summer. The 1,000-h.p. plant is to be increased and provision made for 120 stamps.

NEW ZEALAND.

The Mines Department reports that the exports of gold and silver were as follows, for March and the three months ending March 31:

	Gold.		Silver.	
	1902	1903.	1902.	1903.
March	24.237	53,099	48.364	89,991
Three months	98,727	118,107	131,581	209,152

The increase in gold, this year, was 19,380 oz., or 19.6 per cent; in silver, 77,571 oz., or 58.6 per cent. The gold bullion this year was equal to 106,283 oz. fine gold, or $2,196,870.

SOUTH AMERICA.

CHILE.

Nitrate Producers' Steamship Company.—The gross profit in the year ending April 30, 1903, amounted to £34,863, to which must be added the balance of £896 brought forward from last year, making £35,769. Deducting from this £11,179 for general expenses, interim dividend, etc., there is a balance of £24,590. The directors propose a final dividend at the rate of 7.5 per cent per annum for the last six months, and a bonus of 2.5 per cent, placing to reserve for depreciation, etc., £17,000, leaving £1,331 to be carried forward.

San Jorge Nitrate Company.—The gross profit on 1902 trading amounted to £56,081, which is the largest since 1894, notwithstanding the fact that the production of nitrate of soda has been greatly reduced. A 10 per cent dividend has been declared for the past year, making 28 paid since the organization of the company, which is equivalent to 180 per cent on the capitalization.

MINING STOCKS.

(Full quotations are given on pages 918 and 919.)

New York. June 9.

Investors are perplexed by the bear raid in the copper stocks. Apparently a "freeze-out" has been engineered to the satisfaction of insiders, who are accused by some of abetting the plans of professional speculators. Amalgamated has been in the dumps, selling down to $51 on June 5, which is the lowest price on record, and shows a drop in the market value of the property since March of $38,168,750, or nearly 25 per cent. Anaconda suffered likewise, receding to $21.25 on the same day, which means a depreciation in five months of $37,650,000, or over 125 per cent. Explanation of this depression may be found in the report that one of the largest holders has been the heaviest seller.

On curb brokers are still guessing what the Stock Exchange contingent will do next. United Copper, of Montana, Amalgamated's rival, contrary to expectation, remains dormant, only a few shares being sold around $17½. Tennessee, controlled by people said to be large sellers of Amalgamated, is free from agitation, and transactions are small at $27½@$29. Greene Consolidated, of Mexico, usually a speculative stock, has rested around $20, without attracting attention. White Knob, of Idaho, is weaker at $13, and British Columbia now sells below $4.

The gold and silver stocks, with few exceptions, are quiet. In the Comstock section, Best & Belcher turned at $2.25; Consolidated California & Virginia eased to $1.55; Ophir to $1.35, and Mexican brought $1.25. Few Cripple Creek shares are visible. Elkton Consolidated is in better form at 45c., and El Paso at 60c. Small Hopes, of Leadville, made sales at 33c.

At the close there is noticeable a firmer tendency in prices, especially in the copper group, but, with every rise, profits are being taken, which again weakens quotations.

Boston. June 9.

(*From Our Special Correspondent.*)

Continued depression and forced liquidation are the only features in the local mining share market, although the latter is only in spots. As a rule, it is considered that copper shares hold fairly well, all things considered. The rapidly fluctuations in Amalgamated Copper are not without effect in the local list. As a result of market conditions, it is figured that 24 copper shares have shown an extreme depreciation since the best prices early this year, amounting to almost $83,000,000; and if the smaller companies were to be included the total depreciation would be swelled close to $100,000,000. The anomaly of the situation is shown in the fact that the highest prices of January and February were before the advent of 15c. copper.

Utah Consolidated, which has held strong on dividend prospects, has fallen $2 to $28, rallying to $29. A $1.50 dividend is announced, payable August 1, although the record date has not been established. The English company has been taken over by a company organized in New Jersey, and the present stock will be exchanged, share for share.

Liquidation by a prominent capitalist caused a decline in United States Mining of $2.25 to $19.75. The same selling caused a decline in United States Coal and Oil of $2.37½ to $10.62½. This interest had probably close to 50,000 shares of these two stocks. Copper Range Consolidated recorded a $6.50 break to $51.50, which is its low price, since the $75 was recorded early in the year. The Copper Range Consolidated now stands next to Calumet & Hecla at the Lake in point of production.

The $2 assessment levied by the Adventure was not unexpected, although it caused a $1 decline in the stock to $5.50. The Adventure's balance sheet May 1 showed a floating debt of $219,520, against which there is cash, copper and supplies at the mine valued at $215,295, leaving a deficit of $4,225.

Quincy fell $5 to $95. It is likely that the latter's next dividend may be $3.50, against the last payment at $2.50. Old Colony Mining is favored with a $1 assessment, payable in two installments in June and October. The stock is selling at $1 and 75c. The company is long of amygdaloid beds, but short of funds.

A $9.25 break in Dominion Coal brought the price down to $75.25, but subsequently it recovered to $79. Dominion Iron and Steel made a new low record at $10.50. In the case of the former it is said that a syndicate has been formed to take over the 40,000 shares which were carried by the failed Toronto banking house. The Dominion Iron and Steel Company announces an additional $1,500,000 issue of capital in the form of bonds to complete construction.

Wolverine, although it is said to be earning at the rate of $10 per share per year, is off $2.50 to $67. Trimountain is off $4 to $83.50, Calumet & Hecla, $15 to $485, and Mohawk, $3.25 to $42. Parrot fell $4.25 to $19.75, recovering to $22, and Winona has fallen $2.25 to $8. Osceola tumbled $9 to $50, ral-

lied to $56, and closed at $53. Tamarack has been absorbed at from $119.50 to $115. Trinity touched $1.75, due to liquidation by some members of the pool. Shannon fell $1.75 to $10.75, due to labor troubles in Arizona. Arcadian made its low record at $2, but rallied to $3 at the close.

Colorado Springs. June 6.

(From Our Special Correspondent.)

The week on the exchange terminated to-day with prices in good form, and the volume of business well up to the average. This was in pleasing contrast with the week previous, when both prices and volume of business were considerably off. The leading feature of the week was the sharp advance in Elkton, which went from 40½c. on Monday to 43½c. yesterday, closing strong to-day at 43c. El Paso has been strong, selling at 63@63½c. on good reports from the mine. Findley weakened, selling down to 14c. C. K. & N. sold at 19@19½c., closing with higher quotations today at 19⅝c., bid, with 20c. asked. Vindicator held steady at 90c., and Portland at $1.30c., with nothing developing in these shares.

Salt Lake City. June 6.

(From Our Special Correspondent.)

The sales of stocks on the Exchange during the week were light, and the market had a weak tendency. A total of 250,945 shares were transferred on the regular and open-board calls, bringing the sum of $185,771.

The heavy transfers were made in Tintic stocks, which have been in particular favor for several weeks. Lower Mammoth again headed the list in the volume of sales, 64,200 shares changing hands. The price was irregular. After advancing to $1.98 it was battered down to the low point, $1.44, at the close. The transfers of Star Consolidated reached 35,300 on a down market; May Day was wanted to the extent of 26,300 shares. It, too, weakened. Ajax participated at steady prices, 10,900 shares going at 10@10½c. Tetro, Uncle Sam, Victor Consolidated and Grand Central were in slight demand, but at figures not improved over those of last week. Daly Judge seemed to be unusually attractive, closing the week strong. Ontario was bought at $5.40. Daly West was in light demand, with few offerings made. The company declared its June dividend of 60c. per share, $108,000, payable June 15. The company has over $300,000 in its treasury, and will post an extra in July or August. Over 11,000 shares of Sacramento sold at 25@26c. There was some call for Majestic Copper at $3.45, while Ben Butler, of Bingham, was taken up as fast as offered around 12@14c.

San Francisco. June 6.

(From Our Special Correspondent.)

Business in the Comstock shares was a little more active early in the week, in consequence of the rather sharp advance with which last week closed. Later there was a decided reaction, and the market closed comparatively weak, with somewhat lower prices.

Some quotations noted are: Ophir, $1.95@$2, subsequently falling to $1.75; Consolidated California & Virginia, $1.80, dropping off 30c. at the close; Mexican, $1.35@$1.40; Caledonia, $1.35; Sierra Nevada, 90@95c.; Hale & Norcross, 70@75c Potosi, 40c.; Crown Point, 31c.

On the San Francisco & Tonopah Exchange business continues very good. The number of shares sold has been quite large, and buyers seem to be in evidence. Union brought $1.45@$1.50; Colehan, 35@40c.; Gypsie Queen, 27@28c.; Gold Mountain, 25@30c. Some other stocks were in good demand, notably Paymaster, Lucky Tom, Gypsie Queen and Rescue.

In oil stocks, business was only moderately active, but prices continued firm. The prospects are again in favor, Reed Crude and California Standard selling very freely. Twenty-eight brought $4.35; Aztec, 85c.; Reed Crude, 40c.; California Standard, 13c.

COAL TRADE REVIEW.

New York, June 10.

ANTHRACITE.

The demand for anthracite is strong from all consuming territories, and has been stimulated during the week by a lot of irresponsible newspaper talk about a strike of the miners. Everything indicates that there is small prospect of any strike; that the operators will accept without question the delegates appointed by the miners, and that the Conciliation Committee will soon be investigating the many questions the miners will bring before it.

The hearings in the Hearst suit before the Interstate Commerce Commission have been resumed. Nothing new has been elicited. Judge Lacombe is considering the petition of the Commission that certain contracts relating to the sale of coal be produced.

In Lake Superior territory receipts fail to meet the demand and the movement from the docks is so free that little coal is being stored. In Chicago territory, strike talk has received some credence by dealers and consumers, and there was a large increase in orders from this territory during the past week. Along the lower lakes and in Canadian territory business continues active. In the line trade and at points along the Atlantic seaboard demand is still heavy. Many a country dealer has not been able to get what coal he wants, and is trying hard to get more. Retail business shows some falling off at certain points, though the strike talk made many a householder nervous and led him to put in an order for a few tons with his dealer.

BITUMINOUS.

The Atlantic seaboard bituminous trade has a better tone, and prices are a little stronger, ranging around $2.75@$3, f.o.b. New York Harbor shipping port, according to circumstances. We hear that some shippers, with both Eastern and Western outlets, are sending more coal west, where there seems to be a little better demand than in the East. It is thought that the main line roads, by keeping a strict account of cars standing at tidewater waiting for vessels and by strictly enforcing collection of bills for demurrage, are perceptibly interfering with the operations of speculators who use cars as storage yards, but at the same time large shippers are bothered. Generally speaking, the demand for coal has improved, and in some territories more than in others. A few small strikes are reported at the mines, but do not affect shipments to tidewater materially.

Trade in the far East is fairly good, with orders more numerous than a few weeks since. Along Long Island Sound also demand has improved, and consumers are beginning to call for coal in large amounts. In New York Harbor territory demand is fairly strong and is regular. In the all-rail trade the volume of business is about the same, a falling off in orders from one point being met by more orders from another.

Car supply at the mines is 75 to 80 per cent of the demand. Transportation is very good, coal running through in four or five days. In the coastwise vessel market freight rates seem to be declining, particularly on large craft. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 75c.; Boston and Salem, 85c.; Portland, Portsmouth and Bath, 90c.; Lynn and Gardiner, $1.05 and towages to latter port; Newburyport and Saco, $1.15 and towages to latter port; Bangor, $1.25. From the further lower port rates are 10c. higher. From New York Harbor rates are 70@75c. to Sound ports, and $1@$1.15 to Boston, Salem and Portland.

Birmingham. June 8.

(From Our Special Correspondent.)

The approaching convention of the miners is still the main topic of discussion. John Mitchell, the National president of the United Mine Workers, will come to Alabama when the conference between the miners and operators begins, on June 22. It seems pretty well established that the miners are going to make three formal demands in their new wage scale: An advance of 5c. per ton for digging; bi-weekly paydays, and eight hours to constitute a day's work. None of these demands will be granted, except, perhaps, the one about pay-days. The operators claim that they cannot grant the advance nor the shorter hours. The domestic coal operators state that the contract in effect now is hard on them, especially during the summer months, when the demand for steam coal is rather light. The operators believe that they will be able to hold out with the miners and agree upon a reasonable contract, probably a re-indorsement of the present wage scale.

It is learned that there is some coal being stocked to be used in case of a suspension of work at the mines after July 1. Some of the railroads and manufacturing concerns in the district are putting aside a few weeks' supply of coal.

Chicago. June 8.

(From Our Special Correspondent.)

Newspaper reports of the possibility of another extensive strike in the anthracite field have had the effect of increasing the already heavy demand for anthracite. This, combined with the realization of dealers that the market is so crowded as to make it advisable to place orders as early in the month as possible, has given the wholesalers all they can attend to in the last week. The week's sales have probably been the heaviest so far this season. Retailers report that consumers are affected also by the fears of shortage, and are loading their bins as fast as possible. At the June price, $6.20 on cars, or $6.45 at the yard, there is an immediate sale for everything that can be poured in here in the shape of anthracite. The increased demand is general, affecting country trade as well as city trade, especially in the Northwest.

Sales of bituminous are light, as is natural for the season, but there appears to be a general belief on the part of the trade that they will be heavier by the middle of the month. Sales of Western coal have droped off severely, the tendency being to go back to the old preference for Eastern coals, whenever they can be had at almost any price. Illinois and Indiana lump is now well below $2, quotations having ranged for the week from $1.75 to $2. The lower figure probably represents the price at which any amount can be purchased in car-load lots this week. Mine run, Illinois and Indiana, is in the neighborhood of $1.45@$1.55. Smokeless is selling a little better than last week, though the demand is in general light, at $3.75, for Pocahontas, New River and Maryland. Youghiogheny is steady in sales, which are neither very heavy nor very light, at $3.65. Hocking is coming in well, and is a good seller, at $3.50@$3.60.

Cleveland. June 9.

(From Our Special Correspondent.)

The coke situation through the territory is brisk and the demand fair. The foundries are finding some difficulty in using the material at the increased price, but are taking it, nevertheless. Furnace coke is in good demand, and the shipments are heavy, with the stacks getting all they need. The general supply of material is as good as could be expected. The prices are inclined to be more reasonable. The best grade of foundry coke is bringing $4@$4.25; furnace coke selling at $3.50, and the general run of high sulphur and lower grades of coke at $3.25@$3.75 at the oven.

The domestic supply of coal is lively and the dealers in this territory are laying in heavy stocks. Domestic buying has been quite lively, as the fear of a recurrence of strikes has inclined many of the householders to lay in their winter supply. The dealers are not inclined to boost the prices. The supply for the factories has been adequate and the sales in this direction have been normal, with prices stable.

The Lake situation is interesting. The movement this season has been enormous, as the big steel vessels which generally engage in the ore trade exclusively, have been delayed so long in that line that they have been taking up cargoes of coal with the result that the movement to the Northwest has been enormous, and the upper lake docks are congested to an abnormal degree, resulting in delays to the boats at the unloading ports ranging between two and five days. The sales to Northwestern consumers continue at the old prices, based on $2.45 for Pittsburg and West Virginia lump, and $2.35 for Ohio lump.

Pittsburg. June 9.

(From Our Special Correspondent.)

Coal.—There is but little change in the coal markets this week. Nearly all the mines in the Pittsburg District are in full operation, and the supply of railroad cars is entirely satisfactory, but this condition of affairs is not likely to continue. Prices are firm and the demand continues to exceed the supply. The Monongahela River Consolidated Coal and Coke Company has about 25,000,000 bush. of coal loaded and ready to go out on the next rise in the rivers. A shortage of coal is reported at Cincinnati and other down-river ports and prices are advancing.

Connellsville Coke.—The production and shipment continue heavy, but prices are not as strong as they were a month or two ago. Furnace coke is quoted at $3@$3.50, and foundry at $4@$4.50. The *Courier*, in its last report, gives the production for the previous week at 251,328 tons, a gain of over 1,000 tons. The shipments were 11,722 cars, distributed as follows: To Pittsburg and river tipples, 4,282 cars; to points west of Pittsburg, 5,830 cars; to points east of Connellsville, 1,610 cars. This was a gain of 52 cars.

San Francisco. June 6.

(From Our Special Correspondent.)

Trade has been quiet, with about the usual arrivals. Stocks are good, except in Eastern coals, which are in light demand.

Yard prices to dealers for Pacific Coast coals in large lots are as follows: Wellington and New Wellington, $8; Rosslyn, $7; Seattle and Bryant, $6.50; Coos Bay, $5.50; white ash, $5. Rocky Mountain coals in car-load lots are quoted at $14 for Colorado anthracite, and $8.50 for Castle Gate, Clear Creek, Rock Springs and Sunnyside. Eastern coal in cargo lots is at present nominal, but quotations are $14 for Pennsylvania anthracite and $13 for Cumberland. Foreign coal in cargo lots sells as follows: Welsh anthracite, $13; cannel, $8.50; Brymbo, $7.50; Wallsend, $7.50.

Mr. J. W. Harrison's circular of this date says: "Since the *Sonoma* sailed there have been two arrivals of coal from Newcastle, the *Thalatta*, 2,753 tons, and the steamer *Yeddo*, 6,100 tons; total, 8,853 tons. There are only six vessels due to arrive here prior to August 1, and they will carry about 21,000 tons. Their arrival will be gladly welcomed, as our local market is nearly bare of Colonial coal. The reported list of chartered coal carriers from Newcastle and Sydney foots up 84 vessels. The carrying capacity of these ships will approximate 250,000 tons. Prices locally remain firm, as every cargo that arrives is divided up in small quantities to consumers from ship's side. Coal freights from Australia are reported to have declined fully 6d. per ton within the last 10 days, and still lower figures are looked for. The miners in British Columbia do not seem any nearer a settlement at their strike than when the last mail left. The nonfulfillment of the agreement made with the union for the distribution of funds while they were unemployed is causing them to chafe, so that probably empty

stomachs will bring about an early settlement, The cargo just arrived per steamer *Yeddo* from Newcastle is coming to a profitable market. The labor complications in British Columbia, causing a short coal supply here, has proved a great advantage to our Coast collieries. Owners are pushing forward their output, which leaves them a handsome profit."

Foreign Coal Trade. June 11.

Export trade here continues light, and without any special incident.

The coal production of Germany for the four months ending April 30 is reported as follows, in metric tons:

	1902.	1903.	Changes.
Coal	33,831,225	37,194,289	I. 2,363,064
Brown coal	13,344,906	14,319,022	I. 974,116
Total mined	47,176,131	51,513,311	I. 3,337,180
Briquettes made	2,708,880	3,202,120	I. 493,240
Coke made	2,828,700	3,617,052	I. 788,352

The briquettes reported include a small quantity made of peat. The increase in coal mined was 7.1 per cent.

The British Consul at Amsterdam, in his annual report, says: "The import of British coals showed a very considerable falling off from the figures of 1901, a decrease altogether attributable to the industrial depression in Germany, in consequence of which Westphalian coal was offered in considerably greater quantity, and at much lower rates than in the previous year. The export duty on British coal had doubtless also a depressing effect on the trade, coming as it did simultaneously with these cheaper offers from Germany; but under any circumstances the falling off in the Dutch importation would have been a very considerable one."

Messrs. Hull, Blyth & Co., of Cardiff and London, report under date of May 29, that the Welsh coal market remains unchanged and prices are well maintained for all descriptions of coal. Quotations are: Best Welsh steam coal, $3.75@$3.90; seconds, $3.66; thirds, $3.48; dry coals, $3.30; best Monmouthshire, $3.42@$3.48; seconds, $3.30; best small steam coal, $2.22; seconds, $2.10; other sorts, $1.92.

The above prices for Cardiff coals are all f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½ per cent discount.

The freight market remains quiet and unaltered. Some rates quoted from Cardiff are: Marseilles, $1.45; Genoa, $1.38; Naples, $1.32; Singapore, $2.64; Las Palmas, $1.44; St. Vincent, $1.56; Rio Janeiro, $2.04; Santos, $2.40; Buenos Aires, $1.74.

IRON TRADE REVIEW.

New York, June 11.

The iron market shows comparatively little change. In the Central West business in pig iron has been very light, and has been largely confined to buying for near-by delivery by parties who are short on their current requirements. For these deliveries a premium is generally charged. Very little new business has been done for second half delivery. The furnaces are generally working steadily, and are beginning to catch up with their contracts, of which nearly all were behind at the opening of June.

Some pressure is reported for steel billets by outside mills. The large producers, however, are claiming that they have no billets to sell, all being required for their own mills. In some quarters, this is regarded as showing an intention to resist any fall in price of billets. Buyers, however, are expressing no anxiety, and no new orders are being placed. Not much is reported in foreign steel, though it is said that German basic billets are being offered at much better contracts than were asked some time ago.

Finished material is quiet. There is very little doing in the way of new contracts, with the exception of sheets, for which a better demand has developed during the week. There are a good many inquiries for girder rails and trolley material, but no large contracts are noted.

It must be confessed that the reduction in price made by the Southern furnaces has not had a favorable effect. Instead of stimulating business, it has confirmed many buyers in the belief that concessions can be secured all along the line by a waiting policy.

Birmingham. July 6.

(*From Our Special Correspondent.*)

The anticipations of the iron manufacturers in the Southern territory are that buying of iron will start in during this week under the new schedule of prices, announced June 2. The reduction in the quotations was a surprise as to the amount. A prominent ironman, when questioned on the subject, said: "We decided that it would be better to take a big bite right from the start than to nibble a little off at the time. The consumers will appreciate this reduction, no doubt, and enter the market at once." The representatives of the furnace companies in the Association were in session nearly the entire day. The market conditions were discussed, and every feature of the situation and the possibilities of the future thoroughly gone over. The plain announcement that No. 3 foundry iron would be sold at Birmingham at $14.50 per ton was very simple.

There is a belief in certain quarters that iron is likely to go down still more, though officials of furnaces in the Association assert that the lowest prices have been made now. The non-Association furnaces have been selling their product right along almost at the new prices established by the Association. It is not believed they will make any other reductions. In some quarters the statement is made that two or three of the non-Association furnaces have sold ahead as much iron as they can manufacture during the next four months to come.

The following iron prices are now given, Western and Eastern consumers getting the same quotations: No. 1. foundry, $15.50; No. 2 foundry, $15; No. 3 foundry, $14.50; No. 4 foundry, $14; gray forge, $13.50@$14; No. 1 soft, $15.50; No. 2 soft, $15.

As to production the following announcements are made: The Lacey-Buek Iron Company will probably blow out Trussville furnace July 1 for general repairs. The furnace will be practically rebuilt. The Sloss-Sheffield Steel and Iron Company will have one furnace shortly in need of repairs. The Central Iron Company's furnace at Holton, in Tuskaloosa County, is ready, and should go into operation next month. The new furnace of the Alabama Consolidated Coal and Iron Company at Gadsden is completed, and should there be no miners' strike will go into blast about July 15. The old furnace of this company at Gadsden will then go out of blast, and may be rebuilt. The new furnace of the Alabama Steel and Wire Company at Gadsden will hardly be ready for the torch until August. One of the furnaces of the Woodstock Iron Company at Anniston is almost ready, while two of the furnaces of the Sheffield Coal and Iron Company at Sheffield are about ready.

In finished iron and steel circles good reports are made. At the steel plant at Ensley there is a good output. The steel rail mill is doing nicely. At the rolling mills much activity is to be noticed, the season of the year considered. The statement is made that the Birmingham and Gate City rolling mills will be out not longer than a fortnight this summer for repairs, usually made in the summer.

Chicago. June 8.

(*From Our Special Correspondent.*)

It is still a waiting market for the seller of pig iron and a period of stagnation generally. The buyer is shy of contracts for delivery in the latter part of the last half. He continues to want his iron as soon as he can get it, and in small lots. With the continued unrest in labor matters, there is an added cause of the foundryman's reluctance to engage his iron as far ahead as has been his custom. The signs seem to some men in the trade ominous. They are believed to indicate a lull in the prosperity wave, through a combination of causes. To others there is only a healthy shortening of the time between sales and deliveries, which will soon result in a normal adjustment of things. It cannot be denied, on a general survey, that sellers of iron are growing desperate and inclined to cut prices severely in their efforts to get trade.

Prices may be said, in a general way, to be about 50c. lower than last week, though it is hard to tell what iron is really selling for. Quotations of $19.85 @$19.85 for future delivery, and $20.50@$21 for delivery within 30 to 60 days, appear to be about right for Southern No. 2; Northern No. 2 is selling in small lots at $20@$21, on short-time deliveries. Above and below these prices is a range of 50c. more for No. 1, and 50c. less for No. 3, on lots similar as to quantity and time of delivery. As has been the case for a month past, most of the business is in Southern.

Coke is a trifle stronger. Less has been coming in than came last week, through a desire on the part of Western sellers to ease the market of the surplus that began to pile up toward the end of the preceding week. Prices continue $6.65@$7 for first-class foundry.

Cleveland. June 9.

(*From Our Special Correspondent.*)

Iron Ore.—The shipments of ore to June 1 this year were 4,531,576 tons, a decrease from last year of 626,561 tons. The shipment for May, however, shows about a 7 per cent increase over last year. The movement is delayed by the shortage of cars and the slowness of the dock machinery. The freight market is steady but weak, with further talk of forcing a depression of the wild rates. The rates to date are: 80c. from Duluth, 70c. from Marquette, and 60c. from Escanaba. There is talk of ore sales, but it has developed into little or nothing. The prices hold as fixed, being based on $4.50 for bessemer old range, and $4 for bessemer Mesabi.

Pig Iron.—The situation is not changed. Foundry buyers have not been active. The furnaces had been holding out for $20, Valley furnace, for No. 2, but the cut in the prices of Southern iron brought the Northern values down and the present quotation is about $19@$19.50, Valley furnaces. The Southern furnaces of all classes are united on a quotation of $15, Birmingham, for No. 2. The new price brought out but little business in this territory. Very little has been done in the way of additional sales of bessemer. There has been talk of further sales by the outside furnaces, but these are not confirmed in the official statements. Very little iron is left to be sold. The independent furnaces are said to be holding for $19@$19.50, while the association gives to all alike at $18.50. Basic sales have been few and of little consequence. Very little iron is left in this territory for sale, and the few furnaces having uncovered capacity are proceeding slowly, waiting for some further developments to see how production is going to run during the last half of the year. The quotation remains $18.75 in the Valley.

Finished Material.—The structural trade is suffering from the prevalence of labor difficulties. New orders are pending, and will be closed as soon as the contractors can proceed with some understanding as to what may be expected from the men. A number of orders which have been placed for some time will be specified against, as soon as work can be resumed, and many of them will be duplicated. At present deliveries are possible within the shortest time ever given by the mills. The small concerns are getting no premiums, but the jobbers get a little business now and then. The prices hold at 1.60c., Pittsburg, from mills, and 2.15@2.25c. out of stock. The bar situation is not very strong, and bar iron, which is lowering in price. The lowest quotation, which has almost become general, is 1.70c., Youngstown, which, however, is being combatted by some of the larger mills, which are still holding for 1.80c., Youngstown. The bar steel prices have not changed, but the business is slow. The quotations are: 1.60c., Pittsburg, for bessemer, and 1.70c., Pittsburg, for open-hearth. The plate trade has been a little more active in this territory, and booking has been lively, with inquiries quite heavy. The mills, however, have failed to get specifications against former contracts, and the market is soft. The small mills are able to get a little business at a premium, for which they are asking 1.90c., Cleveland. The sheet trade is still active, but not quite so brisk, and the market is easier. Prices do not change from 3.10@3.25c. for No. 27 black sheets, out of stock, as a basis. The inquiry for rails has been active, but no business has been reported. The prices hold at $28, Pittsburg, for standard, and $36, Pittsburg, for light rails.

Philadelphia. June 10.

(*From Our Special Correspondent.*)

Pig Iron.—The representatives of the larger producing companies deny that the weakening tendency in pig iron is as pronounced as it is frequently given out. They state that while they are not selling very much iron their customers are raipdly decreasing their supplies and that they will be in the market very soon at prices, which will not vary very materially from those quoted to-day. The recent reduction in the South has not had the effect on prices in the North that buyers anticipated. The present dullness will probably continue for some time to come. Some of the weaker furnaces continue to make trouble, by giving out low quotations, but the stronger companies are not doing so. In fact, the larger producers in this territory hold much stronger views than are usually found in print. The condition of stocks among the great body of consumers is such as to warrant the belief that a heavy demand cannot much longer be delayed. There are no new developments in foreign pig, but negotiations continue to hang fire without much present probability of resulting in orders. No. 1 foundry is quoted close to $21, except for a few of the more desirable grades; No. 2 does sell close to $20; No. 2 plain can be had at $19; gray forge at $18; though certain brands can be mentioned that cannot be had under $18.50; basic iron is inactive at $19, and Middlesboro No. 3 is quoted dull at $19.50.

Billets.—Quite a number of consumers, both large and small, are taking fresh hope, which they derive from some unknown quarters, that crude steel will drop $1 a ton. The only business heard of in an inquiring way is for supplies that will keep consumers going until the long anticipated break occurs. Those representing manufacturing interests treat very lightly these anticipations of lower prices. Quotations for early delivery are given to-day at $31.

Merchant Bar.—Business in merchant bar is restricted on account of the continued rumors of the weakening tendency. Refined iron is quoted at 1.85c.; steel bars, 1.70c. Business has been done as low as 1.60c. in steel bars to keep business from escaping.

Sheets.—The sheet iron card remains strong with a fair demand for all sheet products.

Plates.—The anxiety of our large plate interests to keep their order books well filled up has resulted in a shading of prices to certain favored buyers. Mills are catching up. On small orders quotations are firm, and even premiums are paid for urgent deliveries. The market cannot be exactly characterized as weak, but it appears to be getting ready for a slightly lower level.

Car-load lots of ¼-in. plate are quoted at 1.75c.; universals, 1.80c.; flange, 1.90c.; marine, 2c.; firebox, 2.10@2.20c.

Structural Material.—New business in structural material has been somewhat restricted, owing to the strikes in the building trades. Beams, channels or angles in ordinary sizes, 1.73½@1.80c., in car-load lots.

Pittsburg. June 9.

(From Our Special Correspondent.)

There is no disposition on the part of consumers to place orders for pig iron for third and fourth quarter at the prices quoted by the furnaces. The market continues firm, but sales are confined to immediate requirements. All contracts made are at a premium over the price named by the Bessemer Furnace Association for delivery covering the full second half. Most of the new business placed during the week is for shipment before July 1, the tonnage booked for July delivery being light. There is but little inquiry for third quarter iron, and none at all for the last quarter. While buying is limited consumption is as heavy as ever and furnaces are daily being urged to hasten shipments on old contracts. Most of the furnaces are turning out full production and few are out of blast this week. Some are in need of repair, and may be forced to blow out soon. Buying of foreign pig iron is at an end, but a few old orders are still being filled. The cut in prices by the Southern furnaces last week has not had any effect in this market. The prices fixed for foundry No. 2 and gray forge, the principal grades bought here, are not much lower than the price held by the Northern furnaces. The rate of $15, Birmingham for No. 2 foundry, is equal to $19.85, Pittsburg, the Northern product, which is considered superior, being held at $20.50, and this price might be shaded. The price of Southern gray forge is $18.60, Pittsburg, which, although over $1 a ton under the price of Northern gray forge, has not had the effect of inducing consumers to place any orders. It is not believed the production of pig iron in the last half will be greater than in the first six months of the year. A car shortage is expected later on, owing to the heavy shipments of ore, and some furnaces are stocking surplus coke in anticipation of trouble. The furnaces are not making any special effort to book new business, and it seems impossible to obtain any concessions on bessemer iron from the price fixed by the association for second half shipment.

The steel market is remarkably quiet, but prices remain firm. There is still a scarcity of crude steel, and no sales of any consequence were made during the week. Some inquiries for late delivery are being received, but sales are confined to early delivery. In finished lines but little new business is being placed. All the Corporation plants and the Jones & Laughlin Steel Company are busy on old contracts. Yesterday several independent mills in the Pittsburg District were idle in some departments, and it was reported that it was on account of a lack of business. The steel bar trade is not as active as it has been since the first of the year, and a number of mills could turn out a larger tonnage. The official price is firmly adhered to, and there is no probability of a reduction. The American Tin-Plate Company is sold up through August, and is taking new business for September delivery only. Independent tin-plate mills are still receiving premiums ranging from 15 to 25c. a box for early shipment. There is now but little doubt that the tonnage of steel rails carried over into next year will be greater than was anticipated. The railroads have asked the rail mills to open the books for next year's business, and the request is being considered. The price for 1904 will no doubt be $28, the same rate that has been in force since the spring of 1901. While the production of steel rails so far this year has been heavy, most of the mills are far behind in deliveries.

All of the annual wage scales of the Amalgamated Association of Iron, Steel and Tin Workers have now been arranged for the year, beginning July 1. The last was the sheet steel scale, which was speedily settled at a brief conference held with representatives of the American Sheet Steel Company during the week. The workers asked for an advance of 15 per cent for the sheet mill hands, and the company asked for a removal of the limit of output. A compromise was made, both demands being withdrawn, and a settlement was made by continuing the present scale for another year. There are no labor troubles now, or in sight, in the iron and steel mills, but serious disturbances in the building trades began this week, and the Builders' League threatens to tie up all building operations in the Pittsburg District before the end of the week. Wages are not involved, the trouble being differences between two labor organizations, the bricklayers and the stonemasons. The Bricklayers' and Masons' International Union claims jurisdiction over the stonemasons, who have a separate organization, and refuse to join the Bricklayers' Union. Several strikes have occurred, and the contractors have determined to stop all building until the two organizations settle their dispute. It is estimated that from 25,000 to 30,000 mechanics and laborers will be idle until the differences are adjusted.

Pig Iron.—Sales of bessemer pig iron during the week were made in lots of from 1,000 to 3,000 tons, aggregating about 20,000 tons, for delivery in June and July. The price ranged from $19.20 to $19.50, Valley furnace. No sales of foundry or forge iron are recorded. No. 2 foundry iron is held at $20.50 @$21, Pittsburg, and gray forge at $19.75@$20, Pittsburg.

Steel.—The market in crude steel is extremely quiet. A few inquiries are being received for bessemer billets for late delivery, but no sales have been made. A few small lots sold this week at $30.50@$31, Pittsburg. Prices in finished lines remain firm, although but little new business is being placed. There is nothing new in the plate or bar markets, and prices continue at 1.60c.

Sheets.—Prices are firmer than a week ago, and an advance over the official price is being quoted by independent interests. The American Sheet Steel Company continues to quote No. 28 gauge black sheets at 2.75c., and galvanized at 3.85c.

Ferromanganese.—There is no change in the market. English ferro is still quoted at $50@$52.50.

St. Louis. June 8.

(From Our Special Correspondent.)

Pig Iron.—The lately announced price of Southern iron as $15, Birmingham, for No. 2, has not as yet brought many buyers into the market from the Mississippi Valley. The inquiries, however, since the cut have been heavy, and are of such a character that agents believe a real buying movement will ensue. The largest sale of the week has been one of 3,000 tons of malleable to the Missouri Malleable Iron Company.

Finished Material.—The demand for all grades of finished iron and steel has been so brisk, that the market has not had time to decline in sympathy with pig metal. The high water of the past week has interfered with business to a considerable extent, and the warehouses of many jobbers in the lower part of the city and in East St. Louis are under water. Shipments have been delayed in consequence. Structural material has been in large demand, as all users are pushing work at hand in order to be on the right side of the next labor dissaffection. The demand for machine supplies, curtailed during the past month, has picked up.

New York June 9.

Pig Iron.—The market continues quiet. We quote for early delivery, Northern iron at tidewater: No. 1X foundry, $20.50; No. 2X, $19.50; No. 2 plain, $19. For Southern iron on dock, New York: No. 1 foundry, $20; No. 2, $19.50; No. 3, $19.

Bar Iron and Steel.—We quote for large lots on dock: Refined bars, 1.85@1.95c.; soft steel bars, 1.80@1.90c.

Plates.—Local demand is good. Sheared plates are quoted: Tank, ¼-in. and heavier, at 1.85@2c.; flange, 2@2.05c.; marine, 2.10@2.20c.

Steel Rails.—The quotation remains $28 for standard sections, f.o.b. mills for 1903 delivery; light rails, $33@$36, according to weight. Relaying rails are $28@$30 for heavy sections and $33@$35 for light sections.

Structural Material.—The local market is expected to improve now that the labor situation has cleared. We quote for large lots at tidewater: Beams, angles, channels and tees, 1.75@2c.

Cartagena, Spain. May 23.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—During the week shipments included three cargoes, 6,430 tons dry ore, to Great Britain; one cargo, 2,800 tons dry ore, to Rotterdam; one cargo, 6,700 tons dry ore, and two cargoes, 6,650 tons, Calasparra magnetic ore, to the United States.

Prices of iron and manganiferous ore remain substantially the same as last week, and new business reported has not been very large, although there are considerable inquiries for shipment to America. With regard to the labor difficulties, although the men employed in loading and discharging wagons are still on strike, nevertheless the Carthagena & Herrerias Steam Tramway Company has been able to procure a certain number of outside men, who are at present loading and discharging wagons under the protection of the civil guards. Of course, under these circumstances the quantity of mineral brought down is very much restricted, but it is anticipated that next week the service will resume its normal condition.

Prices are firm at 6s. 9d.@7s. per ton, f.o.b. shipping port, for ordinary 50 per cent ore; 7s. 3d.@7s. 9d. for special low phosphorus; 9s. 3d. for 58 per cent specular ore. Magnetic ore, 60 per cent iron, is 11s. for lump and 9s. 6d. for smalls. Manganiferous ores range from 14s. 6d. for 20 per cent manganese and 20 iron, to 9s. 9d. for 12 manganese and 35 iron.

CHEMICALS AND MINERALS.

(See also Prices-Current, page 920.)

New York, June 10.

Business in manufactured products continues quiet, although prices are most advantageous to consumers, owing to competition. The raw material market shows spots of weakness, but at primary points the combinations are unswerving.

There is nothing new to be said about the proposed powder combination, excepting that the California concerns are in good financial condition. Recently the Giant Powder Company, of San Francisco, paid its 54th monthly dividend of 50c. per share.

Cyanide of Potassium.—Import trade is practically at a standstill, and were it not for the small shipments to Mexico, export business would reflect the same condition. Sellers at New York quote on the basis of 20c. per lb.

Bleaching Powder.—Importers are vieing with domestic makers to hold customers in future by offering to make long time contracts at prices that years ago were unheard of. Our readers may remember that when the European manufacturers' agreement was disrupted months ago we expressed the belief that prices would go below $1 per 100 lbs. Consumers can now testify to this prediction. We venture to add that still lower prices will be made in the near future, and it would not be surprising to see the larger manufacturers abroad formulate another agreement to rehabilitate the market. A new compact will, of course, have to be adjusted to the requirements of old process bleach makers, but there is no doubt that the electrolytic works will lead the trade eventually. Meantime buyers can purchase good foreign bleach at $1@$1.10 per 100 lbs., f.o.b. New York, and American, at 75c.@$1, f.o.b. works.

Barytes.—Prime white barytes have strengthened, owing to the heavy consumption in the paint trade, and the limited supply. Off-color, however, is slow of sale. By this it should not be inferred that domestic production of all grades of barytes is less than the demand. On the contrary, the output of off-grades is increasing, and it is reported that the domestic combination has discontinued work at one of its large mills. Importers, on the other hand, expect to do a better business in snow white barytes, and, if their hopes are realized, we may look for a revival from the demoralization caused by low prices in recent years.

Copper Sulphate.—There has been a reaction in prices to $4.50@$5 per 100 lbs., f.o.b. New York. Importers appear willing to book at the latter figure, and will doubtless accept less, notwithstanding the ½c. per lb. duty.

Acids.—Demand is small, as large consumers are pretty well supplied, and smaller ones are awaiting the outcome of the labor troubles before ordering. Meantime, makers are keeping their plants in operation, and are likely accumulating stocks in expectation of an active demand in the fall. Prices are quoted unchanged, as below, per 100 lbs., unless otherwise specified, for large lots in carboys or bulk (in tank cars, delivered in New York and vicinity.

Muriatic, 18°....	$1.50	Oxalic com'l...	$5.25@$5.50
Muriatic, 20°....	1.60	Sulphuric, 50°,	
Muriatic, 22°....	1.75	bulk, ton ...	13.50@14.50
Nitric, 36°.....	4.37½	Sulphuric, 60° .	1.05
Nitric, 38°.....	4.75	Sulphuric, 60°,	
Nitric, 40°.....	5.00	bulk, ton	18.00@20.00
Nitric, 42°.....	5.37½	Sulphuric, 66°,	1.20
		bulk, ton ...	21.00@23.00

Brimstone.—The anxiety to book orders has created keen competition among importers, which has resulted in a further cut in prices. Spot goods can be had now at prices that were heretofore quoted on future shipments, but so few are the buyers that the trade is not alarmed. Best unmixed seconds on spot is quoted at $22@$22.25 per ton, while shipments can be had at $21.75@$22.

Pyrites.—Momentarily the trade is quieter, as fertilizer acid makers are pretty well supplied with pyrites.

We quote: Domestic pyrites, $5 per ton for lump ore, f.o.b. Atlantic coast mines, and 10c. per unit for fines; sulphur content varies from 42@44 per cent. Spanish pyrites, carrying from 46@52 per cent sulphur, are quoted at 11@12c. per unit for lump and 10@10½c. for fines, delivered at Atlantic ports.

Nitrate of Soda.—There continues to be a good demand for this article, and producers are holding for higher prices. Vessels are scarce at shipping ports, causing ocean freight rates to rise to 20s.@20s. 3d. ($4.80@$4.86). Importers ask $2.15 per 100 lbs. for spot nitrate; $2.10 for arrivals, and $2@$2.02½ for futures.

Reports from abroad state that the nitrate season is practically over, and that importers are now figuring on supplies for next spring delivery.

The Santa Catalina Nitrate Company has declared a second quarterly dividend of 3 per cent, free of income tax; the Santiago Nitrate Company, 6 per cent, and the Anglo-Chilean Nitrate and Railway Com-

pany, 14s. per preference share, and 14s. per ordinary share.

It is announced that there are to be further sales by the Chilean Government of nitrate lands in the Provinces of Tarapaca and Antofagasta. The last sale of land in the Magellan territory was very successful. Apparently we shall see the opening up of a number of new oficinas before the expiration of the present producers' combination, in 1905. The result can be surmised, and will likely cause dissatisfaction to the older members of the combination, since their respective quotas will have to be adjusted accordingly.

Sulphate of Ammonia.—In the absence of demand prices have receded to $3.12½ per lbs. for gas liquor for immediate delivery, and to $3.02½ for future shipment.

Phosphates.—New orders are limited in number, as exporters demand higher prices, and are not inclined to cater to trade unless it promises to put the market on a more stable basis in future. Domestic business is quiet.

Judging from the heavy shipments from Florida the high-grade rock people are doing a larger export trade than last year. In May the exports from Savannah amounted to 14,103 tons, making 72,989 tons since January, which is 4,638 tons more than 1902. Germany received the bulk of these shipments, and Dutton & Co., and Schilmann & Bene were the principal exporters.

Domestic shipments of South Carolina rock from Charleston in May were 2,812 tons, making 28,746 tons for the five months this year.

Recently the Prairie Pebble Phosphate Company, of Savannah, Ga., owning much land in Florida, obtained permission to issue $2,000,000 in 5 per cent bonds. It will be recalled that Messrs. Hull, who controlled this company, have of late been large purchasers of pebble interests in Florida, hence the bonds will doubtless be used to satisfy claims. Estimating on last year's shipments the annual sales of land pebble phosphate by Messrs. Hull cannot be far from 150,000 or 160,000 tons, representing a money value, based on the market price, of nearly $900,000. The greater part of this is realized on export business. To this should be added the value of the various properties and plants under control in order to adequately show upon what assets the Messrs. Hull intend to issue the bonds.

Phosphates	Per ton F. o. b.	United Kingdom or European Ports. Unit.	Long ton.
*Fla. hard rock (77@80%)	$7.00@$7.50	7⅛@7⅝d.	$11.02@11.89
*Fla. land peb. (68@73%)	3.50@ 3.75	5½@5¾d.	7.70@ 8.05
†Tenn., (78@82%) export.	3.75@ 4.00	6½@7d.	10.40@11.20
†Tenn., 78% domestic	3.50@ 3.75	.....	.....
†Tenn., 75% domestic	3.25	.....	.....
†Tenn., 73@74% domestic	2.70@ 2.95	.....	.....
†Tenn., 70@72% domestic	2.45@ 2.70	.....	.....
‡So. Car. land rock	....@ 3.25	.....	.....
‡S. Car. riv. r'k (55@60%)	2.75@ 3.00	5@5⅝d.	5.80@ 6.23
Algerian (63@70%)	.....	5⅝@6¼d.	7.09@ 8.02
Algerian (58@63%)	.....	5¼@6d.	6.15@ 7.26
Gafsa (Tunis)	.....	5¼@6d.	6.15@ 7.26
Christmas Isl. (80@85%)	.....	7¼@7¾d.	12.04@12.87

* Fernandina, Tampa, Brunswick, Savannah or Port Inglis.
† Mt. Pleasant. ‡ On vessels. Ashley River.

Liverpool. May 27.

(*Special Report of Joseph P. Brunner & Co.*)

Soda Ash is well held. For tierces, nearest values may be called about as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d. per ton, net cash. Ammonia ash, 48 per cent, £4 5s. @£4 10s.; 58 per cent, £4 10s.@£4 15s. per ton, net cash. Bags 5s. per ton under price for tierces.

Caustic Soda is inclined to be easy, although quotations are nominally unchanged, as follows: 60 per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Special quotations for the Continent and a few other export quarters.

Bleaching Powder is nominally quoted at anything from £3 5s.@£4 per ton for hardwood packages.

Sulphate of Ammonia is dull and lower at about £12 17s. 6d.@£13 per ton, less 2.5 per cent, for good gray 24@25 per cent in double bags, f.o.b. here.

Nitrate of Soda is quiet on spot, but holders still quote from £9 15s.@£10 per ton, less 2.5 per cent for double bags, f.o.b. here, as to quality.

METAL MARKET.

New York, June 11.

Gold and Silver Exports and Imports.

At all United States Ports in April and Year.

Metal	April. 1902.	April. 1903.	Year. 1902.	Year. 1903
Gold:				
Exports	$2,844,204	$1,705,516	$17,916,305	$4,331,627
Imports	1,844,767	1,106,135	7,603,834	9,137,801
Excess.	E. $979,437	E. $599,381	E. $10,312,471	I. $4,806,174
Silver:				
Exports	$3,740,777	$2,019,472	$15,492,683	$13,727,151
Imports	2,031,251	1,616,067	8,471,074	6,676,810
Excess	E. $1,709,526	E. $1,903,405	E. $7,021,589	E. $7,050,341

These exports and imports cover the totals from all United States ports. The figures are furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York.

For the week ending June 10, and for years from January 1:

Period.	Gold. Exports.	Gold. Imports.	Silver. Exports.	Silver. Imports.	Total Excess, Exports or Imports.
Week	$5,090,935	$14,146	$457,764	$48,691	E. $5,390,438
1903	13,586,758	2,944,074	8,000,900	983,680	E. 17,779,754
1902	16,482,960	1,195,049	14,289,145	581,914	E. 28,955,108
1901	20,416,990	1,206,150	14,990,920	1,829,411	E. 32,370,841

Financial Notes of the Week.

General business continues rather quiet. The effect of the numerous labor troubles and of the floods in the West are beginning to be rather apparent. It is probable, however, that the damages done by the latter have been very much exaggerated in the current dispatches. The stock markets continue depressed, and the liquidation in Wall Street is not yet apparently at an end.

Engagements of gold for shipment abroad this week have not been heavy, being limited, up to date, to $500,000 for Germany. The total gold movement which began April 29 has amounted to about $11,900,000, of which $4,750,000 went to South America, chiefly on orders from London. It is probable that this movement is not yet at an end.

In our table of monthly prices last week the average for silver in London for May was given at 25.89d., through an unfortunate error in proof-reading. The correct figure is 24.89d., which is given in the table this week.

The statement of the New York banks, including the 56 banks represented in the Clearing House, for the week ending June 6, gives the following totals, comparisons being made with the corresponding weeks of 1902 and 1901:

	1901.	1902.	1903.
Loans and discounts	$887,599,100	$884,266,900	$915,138,100
Deposits	972,118,800	945,896,500	898,625,000
Circulation	30,933,400	31,466,400	44,102,200
Specie	179,029,700	172,215,600	156,729,800
Legal tenders	77,341,500	75,544,100	72,702,100
Total reserve	$256,371,200	$247,759,700	$229,431,900
Legal requirements	243,029,700	236,474,125	224,656,250
Balance surplus	$13,341,500	$11,285,575	$4,775,650

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars and comparison made with the holdings at the corresponding date last year:

	1902. Gold	1902. Silver.	1903. Gold.	1903. Silver.
N. Y. Ass'd.	$172,215,600	.....	$156,729,800	.....
England	182,754,280	.....	176,757,020	.....
France	514,144,795	$224,188,455	500,608,090	$224,081,980
Germany	195,625,000	72,360,000	168,215,000	59,105,000
Spain	70,625,000	93,395,000	72,640,000	102,770,000
Neth'l'ds	25,200,500	33,982,000	19,697,500	32,881,500
Belgium	15,783,335	7,981,665	14,910,000	7,455,000
Italy	80,810,000	10,948,000	89,860,000	11,283,000
Russia	370,480,000	44,685,000	377,880,000	44,415,000

The returns of the Associated Banks of New York are of date June 6, and the others June 4, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The silver market has continued dull, with a drooping tendency. Bombay advices quote market weak, with lack of buying orders.

The Director of the Mint on June 8 purchased 50,000 oz. of silver for Philippine coinage, at an average price of 53.55c. per oz. delivered.

The United States Assay Office in New York reports receipts of 50,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to May 28 are reported by Messrs. Pixley & Abell's circular, as follows:

	1902.	1903	Changes.	
India	£3,122,725	£3,033,225	D.	£89,500
China	16,500	168,156	I.	151,656
The Straits	62,650	186,079	I.	123,429
Total	£3,201,875	£3,387,460	I.	£185,585

Receipts for the week, this year, were £114,000 in bar silver from New York, £2,000 from Chile, and £5,000 from Australia; total, £121,000. Shipments were £164,100 in bar silver to Bombay and £30,000 to Calcutta; total, £194,000.

Indian exchange is slightly easier, as money is in freer supply in the Indian banks. The Council bills offered in London, however, brought an average of 15.98d. per rupee. Silver has been bought for Indian account rather more freely than for some time past.

The movement of gold and silver in France for the three months ending March 31 is reported by the Ministry of Commerce as below:

	1902.	1903.	Changes.
Gold:			
Imports	Fr. 145,766,000	Fr. 73,926,000	D. Fr. 71,840,000
Exports	15,341,000	15,460,000	I. 119,000
Ex., imp.	Fr. 130,425,000	Fr. 58,466,000	D. Fr. 71,959,000
Silver:			
Imports	24,763,000	21,659,000	D. 3,104,000
Exports	17,920,000	22,728,000	I. 4,808,000
Excess	I. Fr. 6,843,000	E. Fr. 1,069,000	.....

Imports of copper and nickel coins, rated at their face value, were 22,000 fr., against 28,000 fr. in 1902. Exports were 65,000 fr., against 916,000 fr. last year.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$0.43	$0.45
Peruvian soles and Chilean pesos	.39	.42
Victoria sovereigns	4.85	4.88
Twenty francs	3.86	3.88
Twenty marks	4.74	3.80
Spanish 25 pesetas	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

June.	Sterling Exchange	Silver N. Y. Cts.	Copper London. Pence.	Copper Lake, Cts. per lb.	Copper Electrolytic, Cts. per lb.	Copper London, £ per ton.	Tin, Cts per lb	Lead Cts. per lb.	Spelter N. Y. Cts. per lb.	Spelter S. L., Cts. per lb.
4	4.8810	52⅞	24⅛	14 @14½	14 @14¼	59⅜	28¼	4.30 @4.35	5.65 @5.70	5.50 @5.55
5	4.8814	52⅞	24⅛	14 @14½	14 @14¼	58	28⅜	4.30 @4.35	5.65 @5.70	5.50 @5.55
6	4.87⅞	53	24⅜	14 @14½	14 @14¼	....	28⅜	4.30 @4.35	5.65 @5. 0	5.50 @5.55
8	4.87⅞	53	24⅜	14 @14½	14 @14¼	57½	28½	4.30 @4.35	5.65 @5 75	5.50 @5 55
9	4.87¾	52¾	24¼	14 @14½	14 @14¼	56½	28½	4.30 @4.35	5.65 @5.70	5.50 @5.55
10	4.87⅝	5 3/8	24⅛	14 @14½	14 @14¼	56¼	28¼	4.30 @4.35	5.65 @5.75	5.50 @5.55

London quotations are per Long Ton (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c lower than these figures

Copper.—Influenced by the weak tendency of the London standard market, as well as the flatness of the Stock Exchange, the market for copper has again been dull and depressed. Consumers seem to have made up their minds not to place any orders until the general situation has cleared. Inasmuch as practically no stocks have accumulated in first hands, producers are not pressing any metal for sale, and the market is rather nominal at 14@14½c. for lake; 14@14¼c. for electrolytic in cakes, wirebars or ingots; 13¾@14c. for cathodes, and 13¾c. for casting copper.

There are rumors of a strike at the copper mines in Arizona, which appears to be of quite a serious nature.

The market for standard copper in London, which last week closed at £58, opened on Monday at £57 2s. 6d., and the closing quotations on Wednesday are cabled as £56 5s.@£56 7s. 6d. for spot, and £55 10s.@£55 12s. 6d. for three months promt.

For refined and manufactured sorts, we quote: English tough, £61@£61 10s.; best selected, £62@£62 10s.; strong sheets, £70@£71; Indian sheets, £67@£68; yellow metal, 6¼@6⅜d.

Exports and imports of copper at New York, Philadelphia and Baltimore in the week ending June 9, and for the year to date, are reported by our special correspondents as follows, in long tons:

Exports:	Week.	Year.
Austria	.....	2,647
Belgium	20	809
France	1,137	10,517
Germany	385	11,168
Holland	495	17,992
Italy	100	1,411
United Kingdom	273	7,282
Other countries	22	2,721
Total copper	2,632	54,493
Matte	37	211
Imports:		
Copper	650	11,312
Matte	....	679

There is an improvement in the movement this week, particularly in exports to France. Of the imports 180 tons copper came from Japan.

Tin.—Prices have ruled within narrow limits, and the business transacted has not been out of the ordinary. The closing quotations are 28¼c. for prompt and 28c. for futures.

The foreign market, which closed last week at £128 5s., opened on Monday at £126; advanced on Tuesday to £126 15s., and the closing quotations on Wednesday are cabled at £126@£126 2s. 6d. for spot and £123 15s.@£123 17s. 6d. for three months prompt.

Lead is quiet and unchanged, without any special feature. The ruling quotations are 4.15@4.27½c., St. Louis, and 4.30@4.35c., New York.

The foreign market is weak, Spanish lead being quoted £11 7s. 6d., and English lead, £11 10s.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull. Missouri brands bring 4.15c., and desilverized lead 4.27½c. The floods are interfering with shipments out of East St. Louis, and trading is very light.

Our special correspondent reports shipments of lead, stated to the Merchants' Exchange, at 32,280 pigs, an increase of 7,580 over previous week. Receipts for the week were 66,825 pigs.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of May 23, that the price of silver during the week has been 13.50 reales per ounce. Exchange unaltered at 23.25 pesetas to £1. Local quotation for pig lead on wharf, 65.50 reales per quintal; equivalent, on current exchange, to £10 14s. 1d. ped ton of 2,240 lbs., f.o.b. Cartagena. Exports for the week were 67,500 kgs. pig lead and 3,402 kgs. silver bars, all to Marseilles.

Spelter.—The market remains very firm, spot being rather scarce and commanding a premium. The floods in the West have seriously interfered with the output of ore in the Missouri District, as well as with shipments at East St. Louis. The closing quotations are 5.50@5.55c., St. Louis, and 5.65@5.75c., New York.

The foreign market is steady, good ordinaries being quoted £20 15s., and specials £21.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter continues very strong, quotations being 5.50 c., East St. Louis basis. As with lead, the floods are interfering seriously with shipments.

Our special correspondent states the shipments of spelter, as reported to the Merchants' Exchange, at 24,700 slabs, a decrease of 16,855 slabs from previous week. Receipts were 43,690 slabs.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of May 23, that the local market is depressed, owing to the lower price of spelter and the dock laborers' strike. No shipments for the week.

Antimony is unchanged at the last quotations: 7½@8c. for Cookson's; 6¾c. for Hallett's, and 6½c. for Hungarian, French, Japanese and United States Star.

Nickel.—The price is quoted by leading producers at 40@47c. per lb. for large quantities down to ton lots, according to size and terms of order. The price for smaller lots, according to quantity, runs as high as 60c. per lb.

Exports of nickel, nickel oxide and nickel matte from the United States for the four months ending April 30 were 872,848 lbs., against 1,087,576 lbs. in the corresponding period in 1902; a decrease of 214,728 lbs. this year.

Quicksilver.—The New York price is unchanged at $47.50 per flask for large lots, with a slightly higher figure quoted for small orders. The San Francisco quotation is still $44.50@$46 per flask for domestic orders, and $42@$43 for export. The London price is £8 12s. per flask, with the same quotation asked by second hands.

Exports of quicksilver from all United States ports for the four months ending April 30, were 413,908 lbs., against 244,582 lbs. in the corresponding period of 1902; an increase of 169,326 lbs. this year.

Platinum.—Consumption continues good, and prices are firm. Ingot platinum in large lots brings $19 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 72½c. per gram.

Imports of platinum into the United States for the four months ending April 30 were 3,242 lbs., against 2,449 lbs. in the corresponding period in 1902; an increase of 793 lbs. this year.

Minor Metals and Alloys.—Wholesale prices, f.o.b. works, are as follows:

Aluminum.	Per lb.		Per lb.
No. 1 99% ingots	33@37c.	Ferro-Tungsten (37%)	28c.
No. 2 90% ingots	31@34c.	Magnesium	$2.75
Rolled Sheets	4c. up	Manganese, pure (N. Y.)	60c.
Alum-bronze	20@23c.	Mangan'e Cop. (20% Mn)	32c.
Nickel-alum	33@39c.	Mangan'e Cop. (30% Mn)	38c.
Bismuth	$2.10	Molybdenum (Best)	$1.82
Chromium, pure (N.Y.)	80c.	Phosphorus foreign	45c.
Copper, red oxide	50c.	Phosphorus American	70c.
Ferro-Molyb'um (50%)	$1.25	Sodium metal	50c.
Ferro-Titanium (10%)	90c.	Tungsten (Best)	62c.
Ferro-Titanium (20@25% N. Y.)	55c.		

Variation in prices depends on size of orders, deliveries, etc.

Missouri Zinc Ore Market. June 6.

(From Our Special Correspondent.)

Five weeks ago it was noted that there was not over 3,000 tons of reserve ore in the bins throughout the Joplin District. To-night there are not 1,000 tons, every pound of which is sold, while several instances are reported of next week's output having been purchased ahead of the production. Never before in the history of the zinc industry in the Joplin District has such an occurrence been recorded. The reserve stock has seldom been lower than 5,000 tons before, if ever, while as high as 20,000 tons was piled up here at one time. This year opened with a reserve stock of about 12,000 tons of zinc, all of which is gone, yet the sales of this year are 12,821 tons less than the same period of last year. The only inference to be drawn from this is that the output this year has fallen off over 20,000 tons. The welfare of the district has not suffered from the decreased output, as the value of the reduced product is $316,633 greater than the value of the larger product of the same period of last year.

Although the week has been a clean-up one on reserve ore, it was done so quietly and unostentatiously that prices were advanced only here and there a half dollar and a dollar, and two of the shrewdest buyers have the market pretty well in their own hands. That is, they have loaded the last of the reserve stock, and if there is an advance, which it is hard to prevent under existing conditions, these buyers will be supplied ahead.

When the reserve stock was lowered to 3,000 tons May 1, it was considered dangerously low, and a movement was started by some of the smelters to increase the reserve by reducing the price on zinc. It was forced down $2 per ton in the face, as pointed out at that time, of every condition pointing to an exactly opposite future. It might have been possible to have kept the price down to a $35 basis, but for the water flooding the mines. This resulted in a reaction that restored zinc to a $37 basis, but with the top still at $40.

The market took on one of those peculiar features that occur from time to time when the ore is badly needed, and an effort is made to secure it without disturbing the general market. The high price was left at $40, but instead of only 64 per cent zinc being sold at this price, nearly all the ore above 62 per cent was purchased at $40. It will be seen that the market condition is such that it would be impossible to give correctly an assay basis. The $37 point is quoted from the buyers, but they bought the ore largely on straight bids. Some buyers asserted that they purchased ore on a $35 basis. If they did, their customers were certainly on the wrong side of the market.

There was no change in the lead market, the price ruling at $54 per ton.

Following are the sales of zinc and lead from the various camps of the Joplin District for the week ending to-day:

	Zinc, lb.	Lead, lb.	Total Value.
Joplin	4,011,170	331,240	$83,150
Carterville & Webb City	1,398,380	366,010	34,354
Galena and Empire	918,850	104,800	20,022
Duenweg	522,280	50,890	10,775
Aurora	460,100	8,600	6,975
Oronogo	357,530	3,720	6,561
Prosperity	283,520	6,790	5,286
Alba and Neck	266,620	.....	4,799
Granby	318,000	23,000	4,705
Mitchell	191,200	4,530	3,753
Carl Junction	114,090	.....	2,168
Cave Springs	96,540	11,980	2,166
Central City	67,090	1,230	1,140
Spurgeon & Spring City	69,080	22,210	1,138
Total sales	9,131,490	951,810	$188,923
23 weeks	216,161,260	25,297,320	$4,355,624

Zinc value the week, $163,492; the 23 weeks, $3,664,890. Lead value the week, $25,431; the 23 weeks, $690,734.

Compared with the previous week the shipment was an increase of 75 tons of zinc, 38 tons of lead, and in value $4,995. Compared with the same week of last year, when zinc sold at $34, and lead at $44.50 per ton, the shipment was 664 tons of zinc and 105 tons of lead less, but the value was $8,582 more. The shipment to date this year is 12,821 tons of zinc and 2,060 tons of lead less, but the value is $316,633 more.

Average Prices of Metals per lb., New York.

Month.	Tin. 1903.	Tin. 1902.	Lead. 1903.	Lead. 1902.	Spelter. 1903.	Spelter. 1902.
January	28.33	23.54	4.075	4.000	4.865	4.27
February	29.43	24.07	4.075	4.075	5.043	4.15
March	30.15	26.32	4.442	4.075	5.349	4.28
April	29.81	27.77	4.567	4.075	5.550	4.37
May	29.51	29.85	4.325	4.075	5.639	4.47
June	....	29.38	....	4.075	....	4.90
July	....	28.38	....	4.075	....	5.27
August	....	28.23	....	4.075	....	5.44
September	....	26.60	....	4.075	....	5.49
October	....	26.07	....	4.075	....	5.38
November	....	25.68	....	4.075	....	5.18
December	....	25.68	....	4.075	....	4.78
Year	....	26.79	....	4.069	....	4.84

Note.—The average price of spelter in St. Louis for the month of January, 1903, was 4.689c. per lb.: for February, 4.861c.: for March, 5.174c.; for April, 5.375c.; for May, 5.469c.

Average Prices of Copper.

Month.	New York Electrolytic. 1903.	New York Electrolytic. 1902.	Lake. 1903.	Lake. 1902.	London Standard. 1903.	London Standard. 1902.
January	12.159	11.053	12.361	11.322	53.52	48.43
February	12.778	12.173	12.901	12.378	57.34	55.16
March	14.416	11.882	14.572	12.188	63.85	53.39
April	14.454	11.618	14.642	11.986	61.72	52.79
May	14.435	11.856	14.618	12.226	61.73	54.03
June	.....	12.110	.....	12.360	....	53.93
July	.....	11.771	.....	11.923	....	52.89
August	.....	11.404	.....	11.649	....	51.90
September	.....	11.480	.....	11.760	....	52.69
October	.....	11.449	.....	11.722	....	52.18
November	.....	11.288	.....	11.533	....	51.03
December	.....	11.430	.....	11.590	....	50.95
Year	.....	11.626	.....	11.887	....	52.46

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Month.	1903. London. Pence.	1903. N. Y. Cents.	1902. London. Pence.	1902. N. Y. Cents.	1901. London. Pence.	1901. N. Y. Cents.
January	21.98	47.57	25.62	55.56	28.97	62.82
February	22.11	47.89	25.41	55.09	28.13	61.06
March	22.49	48.72	25.00	54.23	27.04	60.63
April	23.38	50.56	24.34	52.72	27.30	59.29
May	24.89	54.11	23.71	51.31	27.43	59.64
June	....	....	24.17	52.36	27.42	59.57
July	....	....	24.38	52.88	26.96	58.46
August	....	....	24.23	52.52	26.94	58.37
September	....	....	23.88	51.52	26.95	58.26
October	....	....	23.40	50.57	26.62	57.59
November	....	....	22.70	49.07	26.12	56.64
December	....	....	22.21	48.03	25.46	55.10
Year	....	....	24.09	52.16	27.11	58.95

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

DIVIDENDS.

Name of Company.	Date.	Per Share.	Total.	Total to Date.
†Am. Cement	June 15	.40	$80,000	$620,000
Barreno, Mex.	June 15	.86	2,064	53,946
Calumet & Hecla, Mich.	June 19	10.00	1,000,000	81,350,000
*Central Lead, Mo.	June 15	.50	5,000	355,000
*Daly West, Utah	June 15	.60	108,000	2,907,000
*Empire State, Ida.	June 15	.05	25,277	1,713,324
*Homestake, S. D.	June 25	.25	54,600	12,039,750
§Maryland Coal, pfd.	July 1	2.50	47,125	951,885
Maryland Coal, pf., extra	July 1	1.00	18,850	.....
*Mines Co. of Amer.	June 20	.01¼	25,000	180,000
†Mont. Ore Purch.	June 27	2.00	162,000	2,970,000
†National Lead, pf.	June 15	1.75	260,820	13,448,528
*Natividad, Mex.	June 10	4.30	10,320	204,426
†Republic Iron & St., pf.,	July 1	1.75	356,246	5,693,032
*San Rafael, Mex	June 20	8.60	10,320	1,837,912
*Soledad, Mex.	June 20	4.30	4,128	239,560
*Sta. Gertrudis, Mex.	June 25	.43	16,512	2,731,176
*Standard, Idaho	June 20	.05	25,000	2,870,000
†Standard Oil,	June 15	7.00	6,790,000	190,225,000
St. John del Rey, Brazil	June 26	.16	87,402	14,093,397
†St. Joseph Lead, Mo.	June 15	.15	56,250	3,722,000
†U. S. Red. & Ref., pref.	June 20	1.50	59,187	413,634
†U. S. Red. & Ref. com.	June 20	1.00	59,188	354,790

* Monthly. † Quarterly. § Semi-annual.

ASSESSMENTS.

Name of Company.	Location.	No.	Delinq.	Sale.	Amt.
Ajax	Utah	4	June 11	June 29	.05
Alpha Con.	Nev.	27	June 30	July 21	.05
American	Utah	3	June 6	June 24	.01
Ben Butler	Utah	10	June 15	July 2	.00¼
Cadmus	Cal.	..	June 25	.....	.01
Carisa	Utah	..	June 2	June 30	.03
Challenge Con.	Nev.	..	June 23	July 14	.05
Con. Cal. & Va.	Nev.	..	June 2	June 25	.25
Golconda	Utah	5	June 27	July 17	.01¼
Golden Channel Drift	Cal.	3	May 23	June 20	.01½
Jenny Lind	Cal.	17	June 20	July 6	.01½
Justice	Nev.	..	June 8	June 27	.10
Kern River Oil	Cal.	..	June 30	.....	.56
Little Chief	Utah	16	June 8	June 25	.01
Marina Marsicano	Cal.	35	May 25	June 15	.05
Mexican	Nev.	74	June 10	July 1	.10
Morgan	Cal.	..	June 16	.....	.05
Mountain Lake	Utah	..	June 8	July 6	.005
New York Bonanza	Utah	1	July 1	July 21	.03
Nixon placer	Cal.	..	June 30	.....	.05
Occidental	Nev.	42	June 18	July 9	.10
Old Colony & Eureka	Utah	5	June 11	June 29	.01
Scorpion	Nev.	..	June 15	July 17	.05
Shenandoah Con.	Cal.	..	June 18	.....	.02
Silver Shield	Utah	5	June 19	July 7	.04
South Eureka	Cal.	..	June 25	.....	.03

STOCK QUOTATIONS.

NEW YORK.

Company and Location.	par val	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 8. H.	June 8. L.	June 9. H.	June 9. L.	Sales
Amalgamated c., Mont	100	.....	.....	56½	52	54⅞	51	54½	53⅜	54	51¾	53⅜	52	316250
†Anaconda c. Mont.	25	.....	.....	89½	86	86	85	86½	86¼	87	85	85	85	4,785
Anaconda Gold, Colo.	5	.....	.....	.20	.....	.....	.....	.....	.....	.18	.....	.....	.....	2,000
Andes, Nev.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Argentum, J., Colo.	3	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Belcher, Nev.	3	.....	.....	.....	.....	.45	.42	.....	.....	.....	.....	.....	.....	300
Best & Belcher, Nev	3	.....	.....	2 35	2.30	.....	.....	.....	.....	2.35	.....	.....	.....	400
Bullion, Nev.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunswick, Cal.	1	.....	.....	.8	7¾	.....	.....	.....	.....	8¼	8¾	.....	.....	400
Caledonia, Nev.	2½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chollar, Nev.	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
C. K. & N., Colo.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Comstock T., s., Nev.	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Comst T. Bonds	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Cal. & Va., g.s. Nev	2½	.....	.....	1.80	....	1.75	.....	.....	.....	1.55	.....	.....	.....	600
Cons. Imperial, Colo.	1	.....	.....	.....	.....	.07	.....	.....	.....	.07½	.....	.08	.....	900
Cripple Creek c., Colo.	1	.....	.....	.01½	.04	.....	.....	.....	.....	.....	.....	.....	.....	2,000
Elkton g., Colo.	1	.....	.....	.....	.....	.41	.....	.....	.....	.45	.....	.45	.....	700
El Paso, Colo.	1	.....	.....	.....	.....	.....	.....	.....	.....	.60	.....	.....	.....	300
Gold Dollar, Colo.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4½	.....	1,000
Golden Fleece, Colo.	1	.....	.....	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Greene Con., c., Mex.	10	.....	.....	22	21¾	21¾	21⅝	22	21⅜	21½	21	20¾	20	16,256
Hale & Norcross	2	.....	.....	.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Homestake, S. Dak.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Horn Silver, Utah	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Isabella, g., Colo.	1	.....	.....	.17	.....	.....	.....	.....	.....	.....	.....	.18	.17½	1,000
Justice, Nev.	1	.....	.....	.....	.....	.16	.....	.....	.....	.....	.....	.....	.....	500
Leadville, Colo.	10	.....	.....	.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Mexican, Nev.	3	.....	.....	.....	.....	.....	.....	.....	.....	1.25	.....	.....	.....	200
Mollie Gibson, Colo.	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.06¾	.....	300
Moon-Anchor, Colo.	5	.....	.....	.....	.....	.08	.....	.....	.....	.....	.....	.....	.....	300
Occidental, Nev.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.28	.....	300
Ophir, s., Nev.	1	.....	.....	1.75	.....	.....	.....	.....	.....	1.35	.....	.....	.....	700
Overman, Nev.	1	.....	.....	.....	.....	.43	.42	.....	.....	.....	.....	1.75	.....	400
Portland, Colo.	1	.....	.....	.....	.....	1.35	.....	.....	.....	.....	.....	.....	.....	600
Potosi, Nev.	3	.....	.....	.....	.....	.39	.....	.....	.....	.....	.....	1.40	.....	300
Sierra Nevada, Nev.	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.35	.....	.....
Silver Hill, Nev.	1	.....	.....	.....	.....	1 25	.....	.....	.....	.....	.....	.....	.....	100
Small Hopes, Colo.	20	.....	.....	.....	.....	.....	.....	.30	.30	.33	.....	.....	.....	700
Syndicate, Cal.	1	.....	.....	.....	.....	.....	.....	.....	.....	.07	.....	.....	.....	500
Tenn. c., Tenn.	25	.....	.....	29¼	28	28¾	28¼	29¼	27½	29	27½	29	28¼	3,460
Union Con., Nev.	2½	.....	.....	.....	.....	.....	.....	.....	.....	90	.....	.....	.....	100
Union Con., N. C.	10	.....	.....	1⅝	1¼	1⅝	1¼	1⅝	1½	1½	1⅜	1¾	1¾	4,150
Vindicator, Colo.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.85	.....	50
White Knob, g. s., Ida	100	.....	.....	14½	14¾	14¾	14¾	14¾	14¾	13¾	13	.....	.....	65

* Holiday. Total sales 361,616 shares.

BOSTON, MASS.*

Name of Company.	par val	Shares listed.	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 8. H.	June 8. L.	June 9. H.	June 9. L.	Sales
Adventure Con., c.	$25	100,000	7	6¾	6¼	6	6⅛	5½	6¼	6	6	5¼	6	5¼	1,511
Allouez	25	59,511	.....	.....	5¾	5⅛	5⅛	5	6⅛	5¼	6¼	6	6⅛	6	2,920
Amalgamated, c.	100	1,538,879	58	56½	57	52¾	54¾	51¼	54⅛	53⅜	53⅜	51¾	.....	.....	51,101
Am. Gold Dredging	5	80,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.50	525
Am. Z. L. & Sm.	25	60,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anaconda	25	1,200,000	.....	.....	.....	.....	21	.....	.....	.....	.....	.....	.....	.....	40
Arcadian, c.	25	150,000	3	2½	2¾	2⅝	2½	2	2¼	2	3	2	2¾	2½	4,085
Atlantic, c.	25	100,000	9½	.....	10	9⅝	9⅝	9	9¼	.....	9⅝	9⅜	9⅝	.....	453
Bingham Con., g. s.	50	150,000	27	.....	29½	26	26	25½	26	.....	26	25½	26	.....	1,030
Bonanza	10	300,000	.....	.....	60	.....	.....	.....	.....	.....	.70	.....	.....	.....	700
Cal. & Hecla, c.	25	100,000	495	490	495	.....	495	490	.....	.....	490	.....	485	.....	44
Centennial, c.	25	90,000	21	19½	19	18¾	19	17¼	19¼	18½	18½	18	19¼	18	6,382
Central Oil	25	60,000	.....	.....	6¾	.....	6½	.....	.....	.....	.....	.....	.....	.....	95
Con. Mercur, g.	5	1,000,000	.....	.....	.....	.....	1⅛	1¼	.....	.....	.....	.....	.....	.....	350
Copper Range Con.	100	245,000	58	56½	57	52½	53	51½	53⅜	52	53	51¾	53	52	20,536
Daly-West., g. s.	20	180,000	45½	.....	45½	.....	47¼	45	45¾	.....	45⅝	45	45	43½	1,030
Dominion Coal.	100	150,000	82¼	81	84½	81¼	81	75	79	78	76¾	76	77¼	75¼	5,430
Dominion Coal, pf.	100	30,000	.....	.....	113	.....	.....	.....	.....	.....	.....	.....	112	.....	68
Dominion I. & S.	100	100,000	16	15½	17	15	15¼	12¾	14¼	13	13¾	12¾	.....	.....	11,300
Elm River.	12	100,000	3	.....	3	.....	3	.....	3	.....	.....	.....	.....	.....	925
Franklin, c.	25	100,000	9¼	.....	9	8	8⅜	.....	.....	.....	8⅜	8	9	8¼	1,100
Granby	10	1,338,303	5	4¾	4⅞	.....	4⅞	.....	4⅜	.....	4¾	4⅜	.....	.....	1,225
Guanajuato, Con.	5	385,000	1¾	1⅜	1½	.....	.....	.....	.....	.....	1⅝	.....	1⅜	.....	1,100
Isle Royale Con., c.	25	385,000	8	.....	7	7⅛	7⅛	7⅛	7	.....	7	.....	.....	.....	730
Mass Con., c.	25	100,000	.....	.....	6	.....	6⅜	5⅝	6¼	6	6¼	6	.....	.....	1,240
Mayflower, c.	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
† Michigan c.	25	100,000	8	.....	8¼	8	8	.....	.....	.....	8	7⅝	8	.....	1,195
Mohawk, c.	25	100,000	45	.....	45¼	43	42¾	42	43¼	42¾	43¼	42¾	43	42¾	3,345
Mont Coal & Coke.	25	200,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	300
Mont'l & Boston, c.	5	570,000	1⅛	1⅛	.....	.....	.....	.....	.....	.....	.....	.....	1⅛	1⅛	1,525
New Idria.	5	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nova Scotia St. & C.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70½	.....	70
Nova Scotia St. & C. pf	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Old Colony, c.	25	100,000	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.75	.....	985
Old Dominion, c.	25	150,000	15½	15	15¼	15	15⅛	15	15	14⅞	14¼	.....	.....	.....	1,721
Osceola, c.	25	96,150	58	56	58	56	54	50	56	54	54¼	53	54	53	4,335
Parrot, s. c.	10	229,850	24	23	23¼	22¼	22½	19¾	22	21	21¾	21	22	21½	3,139
Phoenix Con., c.	25	100,000	.....	.....	4½	.....	4⅞	4½	4⅜	4⅛	.....	.....	.....	.....	160
Quincy, c.	25	100,000	.....	.....	103	100	103	95	.....	.....	99	.....	97	.....	387
Rhode Island, c.	25	100,000	.....	.....	2¼	.....	2⅛	.....	.....	.....	.....	.....	2⅛	2¼	325
Santa Fe, g. c.	10	250,000	.....	.....	1⅛	1⅛	1⅛	.....	.....	.....	.....	.....	.....	.....	150
Shannon, c.	10	188,153	12⅜	12	12	.....	12	11¼	11⅛	11	11⅛	10½	10⅜	10¾	1,610
Tamarack, c.	25	60,000	119½	115	116½	115	115	110	.....	.....	116	115	115	.....	340
Trimountain	25	100,000	87½	.....	87	86⅛	83¼	85¼	.....	.....	85¼	84½	85	83¼	1,089
Trinity, c.	25	160,000	7¼	6¾	7	6¼	6½	4¼	6	5	6	5¼	6¼	5¾	8,042
United Copper	100	450,000	.....	.....	.....	.....	18	.....	.....	.....	.....	.....	.....	.....	100
United States, g.	25	419,000	21¾	21⅝	21½	21⅜	21⅝	19¾	20½	20¼	20½	19¾	.....	.....	9,208
U. S. Coal & Oil.	25	240,000	13	12¾	12⅞	12¼	12¾	12	12¼	12	12	11⅝	11⅜	10⅝	8,140
Utah Con., g.	5	300,000	30¼	29⅝	30	28	29	28	29¼	28¾	29	28	29	28¼	10,292
Victoria, c.	25	100,000	4¾	.....	5	4¼	4½	4¼	4¾	.....	4¼	4¼	4⅜	4⅞	2,000
Winona, c.	25	100,000	10¼	10	9¾	9	9	8¾	9	8½	8¾	8¾	8⅝	8	4,770
Wolverine, c.	25	60,000	70	69½	69	68¼	68¼	68	67½	.....	67	.....	67	.....	152
Wyandot.	25	100,000	.....	.....	1¾	1½	1½	1¼	1⅜	.....	.....	.....	1¾	1⅝	660

* Boston Stock Exchange. † Ex Dividend. ‡Assessment Paid. Total sales, 177,558 shares.

SAN FRANCISCO.*

Name of Company.	Location.	Capitalization.	May 28.		May 29. H	May 29. L	June 1. H.	June 1. L.	June 2. H	June 2. L.	June 3. H.	June 3. L.	June 4. H.	June 4. L.	Sales.
Central Eureka.	Cal.	$400,000	.....	.....	.....	.....	.....	.....	.....	.....	.91	.....	.....	.....	900
Colebau.	Nev.	1,000,000	.32	.30	.30	.29	.35	.31	.34	.33	.35	.35	.36	.34	7,400
Esperanza.	Nev.	1,000,000	.....	.....	.10	.....	.....	.....	.....	.....	.....	.....	.15	.12	1,100
Eula Con.	Nev.	750,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gipsy Queen.	Nev.	750,000	.26	.....	.26	.....	.....	.....	.28	.27	.27	.....	.28	.26	6,800
Gold Ut., Con.	Nev.	750,000	.31	.25	.27	.26	.27	.26	.26	.24	.25	.....	.26	.22	9,900
Lucky Tom.	Nev.	1,000,000	.15	.....	.16	.15	.17	.16	.16	.15	.....	.....	.16	.....	10,200
MacNamara.	Nev.	500,000	.42	.40	.40	.37	.40	.38	.40	.39	.....	.....	.....	.....	5,940
Mont-Tonopah.	Nev.	1,000,000	1.17½	.....	1.20	.....	.....	.....	.....	.....	.....	.....	1.17½	.....	2,000
Pay master.	Nev.	750,000	.31	.30	.29	.24	.26	.25	.29	.25	.28	.26	.30	.27	19,100
Rescue.	Nev.	500,000	.20	.19	.20	.19	.19	.....	.21	.19	.....	.....	.21	.18	3,700
Salt Lake & Ton.	Nev.	300,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tonopah-Belmont.	Nev.	2,000,000	.....	.....	2.25	2.20	2 15	.....	.....	.....	2.20	2.12½	2.40	2.55	2,000
Tonopah Fraction.	Nev.	750,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tonopah Mfg. Co.	Nev.	1,000,000	.....	.....	.....	.....	.....	.....	.....	.....	9.50	.....	.....	.....	100
Tonopah Midway.	Nev.	1,000,000	.....	.....	.64	.58	.60	.....	.....	.....	.....	.....	.....	.....	600
Tonopah North Star.	Nev.	750,000	.60	.58	.....	.....	.....	.....	.....	.....	.57	.56	.....	.....	1,700
Tonopah Union.	Nev.	750,000	.....	.....	1.60	.....	.....	.....	1.50	1.45	.....	.....	1.55	1.30	1,100
United Tonopah.	Nev.	1,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utonia.	Nev.	1,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	.....	.....	1,000

* San Francisco & Tonopah Mining Exchange. Total sales, 72,540 shares.

COAL, IRON AND INDUSTRIAL STOCKS.*

Name of Company.	Par val	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 8. H.	June 8. L.	June 9. H.	June 9. L.	Sales
Allis-Chalmers, U. S.	100	.....	.....	14¼	12	.....	.....	.....	.....	.....	.....	.....	.....	121
Allis-Chalm's, pf, U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	80	34
Am. Agr. Chem., U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Agr. Chem. pf, U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Sm. & Ref., U.S.	100	.....	.....	47½	45¾	48¼	45¾	48¾	46	45⅝	45¼	46¾	45½	24,010
Am. Sm. & Ref. pf, U.S.	100	.....	.....	94	94	94	93½	93	93	93¾	93¾	94	93½	1,700
Am. Steel & Fdy., U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. S. & Fdy. pf., U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. Fuel & I., Colo.	100	.....	.....	67½	66	66	64¾	66	65½	65	64½	67	65	9,170
Col. & H. C. & I., Colo.	100	.....	.....	.....	.....	.....	15½	15	.....	.....	.....	15	15	15¼	1,300
†Crucible Steel, U. S.	100	.....	.....	16¾	16	15⅞	15	15½	13⅜	15½	14½	15⅜	14½	7,127
†Crucible Steel, pf, U S	100	.....	.....	82	81½	81	80½	81	80	81½	80½	80⅜	80½	1,398
† Mong. R. Coal, Pa.	100	.....	.....	10⅝	10⅛	10⅜	10⅛	10⅝	10⅜	.....	.....	10⅝	10⅜	2,520
† Mong. R. Coal pf, Pa	100	.....	.....	.....	.....	40	39¾	39¾	38¾	.....	.....	40	40	170
National Lead, U.S.	100	.....	.....	16¾	16	16¾	16	16¼	16	16¾	16	16	15¾	5,050
National Lead pf, U.S.	100	.....	.....	.....	.....	86¾	86	85½	85½	86	83	.....	.....	550
†Phila Nat. Gas.	100	.....	.....	42½	42¾	.....	.....	.....	.....	.....	.....	40¾	40¾	1,115
†Phila Nat. Gas, pf.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
†Pittsburg Coal, Pa.	100	.....	.....	28¾	28	28	28	28	27¾	27¾	27½	27¾	27¼	2,205
†Pittsburg Coal pf, Pa	100	.....	.....	86¾	86¼	86¾	85¾	85¾	85⅝	86¾	85¾	85¾	85½	995
Republic I & S., U.S.	100	.....	.....	15½	14¾	15	14⅜	15	14	14¼	13¾	14	13¾	10,080
Republic I. & S., pf, U.S.	100	.....	.....	75¼	75¼	75⅝	75	75	74	74⅜	74⅜	71	70	1,611
Sloss-Shef S. & I., Ala.	100	.....	.....	44¾	44	44	42½	.....	.....	.....	.....	43	39¾	42	39⅛	4,100
Sloss-Sheff S. & I. pf, Ala.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	88	87	.....	.....	200
Standard Oil, U.S.	100	.....	.....	661	650	650½	650	651	647	649½	642	.....	.....	450
Tenn. C. I. & R. R., Ala.	100	.....	.....	55	53	53¾	50	53	51¾	.....	.....	50¾	50	23,765
U. S. Red & Ref., U. S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Red & R. pf., U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U.S. Steel Corp., U.S.	100	.....	.....	32¼	31½	31½	31	31⅞	31⅜	31⅝	31	30⅝	29¾	101787
U.S. Steel Corp. pf, U.S.	100	.....	.....	82¾	81½	81½	80¾	81¾	81	81	80	80¾	79¾	42,916
Va.-Car Chem., U.S.	100	.....	.....	58	57½	57	56	57	57	56½	55½	55¾	55	2,525
Va.-Car Chem. pf, U.S.	100	.....	.....	.....	.....	118½	118	.....	.....	.....	.....	119	119	118	118	470
Va. I. C. & Coke, U. S.	100	.....	.....	.....	.....	27	27	.....	.....	.....	.....	.....	.....	.....	.....	160
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* New York Stock Exchange. † Pittsburg Stock Exchange. ‡Ex-Dividend. Total sales, 245,949 shares.

COLORADO SPRINGS, COLO.*

Name of Company.	Par val	June 1. H.	June 1. L.	June 2. H.	June 2. L.	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	Sales
Acacia.	$1	09½	08¾	.09	.08¾	08¾	08¾	08¾	07½	08⅝	.08	.....	.....	1,000
Am. Con.	1	.02½	.....	.02½	.02	02⅜	.02	.02½	.....	.02½	.....	.....	.....	.....
Anaconda.	1	.17	.....	.20	.....	.18	13½	17	13½	.18	.15	.....	.....	.....
Ben Hur.	1	.02¼	.02	.02¼	.02	.02¼	.2	.02¼	.02	.02¼	.02	.....	.....	.....
Blue Bell.	1	.05	.....	.06¼	.....	.06	.05½	.06¼	.05	.06	.05	.....	.....	1,040
C. C. & M.	1	.02¼	.02	.02¼	.02	.02¼	.02	.02¼	.02	.02¼	.02	.....	.....	1,000
C. K. & N.	1	.19¾	.19¼	.20	.18	.20	.19½	.20	.19½	.20	.19½	.....	.....	3,000
C. C. Con.	1	.04	.....	.05	.04¼	.04	.....	.04¼	.04	.04¼	.04	.....	.....	2,000
Coriolanus.	1	.03¼	.....	.08	.....	.03	.....	.03	.....	.03	.....	.....	.....	.....
Des Moines.	1	.02¾	.02¼	.03	.02¼	.02¾	.02¼	.02¾	.02¼	.02¾	.02¼	.....	.....	40
Dr. Jack Pot.	1	.09	.08¾	.09	.08⅞	.09	.08¼	.09	.....	.09	.....	.....	.....	3,000
Elkton Con.	1	.39	.....	.40¾	.40	.42	.40½	.44	.43¾	.43½	.42½	.....	.....	6,700
El Paso.	1	.64	.60	.62	.60	.63	.61¼	.64	.63	.63¾	.63¼	.....	.....	5,000
Fannie Rawlings.	1	.04	.03½	.04	.03½	.04	.03¼	.04	.03½	.04	.03½	.....	.....	.....
Findley.	1	.14½	.12	.14½	.....	.14¼	.13¾	.14½	.13¼	.14¼	.13½	.....	.....	13,000
Gold King.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Dollar Con.	1	.05¾	.05¾	.06¾	.05½	.06¾	.05¾	.06¾	.05¼	.06¼	.05¼	.....	.....	3,000
Golden Cycle.	1	.73	.70	.73	.70½	.72	.70½	.72	.71	.72	.71	.....	.....	500
Golden Fleece.	1	.11	.05	.10	.05	.11	.06	.11	.06	.11	.05	.....	.....	.....
Gould.	1	.04	.....	.04	.03	.03½	.03	.03½	.03	.03½	.03	.....	.....	.....
Hart.	1	.02	.....	.02	.....	.02	.....	.02¼	.....	.02¼	.....	.....	.....	.....
Isabella.	1	.16½	.15¾	.16½	.16	.16¼	.15¾	.16¼	.16	.16¼	.16	.....	.....	7,600
Jack Pot.	1	.10	.....	.10	.....	.....	.....	.10	.....	.10	.....	.....	.....	.....
Last Dollar.	1	.60	.....	.60	.....	.60	.....	.60	.....	.60	.....	.....	.....	.....
Lexington.	1	.04¼	.03¾	.04¼	.03¾	.04¼	.03¾	.04½	.....	.04½	.03¾	.....	.....	1,000
Little Puck.	1	.03¼	.03	.03¼	.03	.03¼	.02¾	.02	.....	.05	.02¾	.....	.....	6,000
Mollie Gibson.	1	.07	.05½	.06¼	.05½	.06¼	.05½	.06¾	.05½	.06¼	.05½	.....	.....	5,000
Moon Anchor.	1	.08	.....	.08	.....	.09	.....	.09	.....	.09	.....	.....	.....	.....
New Haven.	1	.03	.02½	.03¾	.02¼	.03	.02½	.02¾	.02	.02¾	.02¼	.....	.....	.....
Pharmacist.	1	.04	.....	.04	.....	.07½	.04	.05¼	.04¼	.05	.04¾	.....	.....	.....
Pinnacle.	1	.04¼	.....	.04¼	.....	.04¼	.....	.04¼	.....	.04¼	.....	.....	.....	.....
Pointer.	1	.01¾	.009	.01¾	.01	.....	.....	.01¾	.009	.01¾	.009	.....	.....	.....
Portland.	1	1.35	1.27½	1.36	1.27	1.40	1.27	1.34	1.29½	1.35	1.30	.....	.....	700
Prince Albert.	1	.03	.02	.03	.02	.03	.....	.03	.....	.03	.02	.....	.....	.....
Vindicator.	1	.92	.80	.91	.89½	.92	.89	.92	.88	.92	.88	.....	.....	1,700
Work.	1	.06¾	.....	.03¾	.....	.06¾	.....	.06¾	.06	.....	.....	.....	.....	.....

*Colo. Springs Mining Stock Exchange. † Holiday. All mines are in Colorado. Total sales 61,800 shares.

COLORADO SPRINGS. (*By Telegraph.*)

Name of Company.	June 8. H.	June 8. L.	June 9. H.	June 9. L.
Acacia.	.08½	.07¾	.08¾	.07¾
Am. Con.	.02½	.02	.02½	.02
Anaconda.	.18	13½	.15¾	.13½
Blue Bell.	.06	.05	.06	.05
Cripple Creek Con.	.05	.04	.05	.04
C. K. & N.	.20	.18¾	.20¼	.18¾
Doctor Jack Pot.	.09	.08	.09	.08
Elkton, Con.	.44	.40½	.

STOCK QUOTATIONS

MEXICO*. May 22.

Name of Company	Share Issued.	Last div'd	Prices. Bid.	Prices. Ask.
Durango.				
Ca. Min. de Penotes	2,500	$50.00	$4,000	$4,500
San Andres de la Sierra	200	.....	10,000	.....
Guanajuato.				
Angustias, Pozos	2,400	5.00	70	72
Cinco Senores y An., aviadoras	2,000	15.00	180	185
Cinco Senores y An., aviada	400	10.00	175	180
Providencia, San Juan de la Luz	6,000	2.00	118	120
Queensland y Australia	300	.....	95	195
Guerrero.				
Delfina, 1st serie	2,500	.....	45	40
Delfina, 2d serie	2,500	.....	30	29
Garduno y Anexas	7,200	.....	35	60
Hidalgo.				
Amistad y Concordia	9,600	6.50	75	75½
Carmen, aviada	1,100	.....	160	175
Guadalupe Fresnillo Mill	1,000	.....	250	300
Guadalupe Fresnillo Mine	1,400	.....	70	80
La Blanca, aviadora	1,536	.....	1,100	1,120
La Blanca, aviada	768	.....	850	880
La Reina y An., aviadora	5,000	.....	19	21
Luz de Maravillas, aviadas	1,100	.....	20	.....
Maravillas y An., aviador	1,680	.....	90	.....
Maravillas el Lobo	1,000	.....	130	180
Palma y An., aviador	1,800	.....	.....	12
Real del Monte	2,554	10.00	650	700
Refugio, avadia	12,870	.....	7	5
Santa Ana y An., aviadora	1,800	.....	30	40
Santa Ana y An., aviada	600	.....	25	30
Sta. Gertrudis y An., aviadas	9,600	.....	.....	7
Sta. Gertrudis y An., aviadora	28,800	1.00	79½	80
Santo Tomas Apostol aviadoras	5,100	.....	1	3
San Felipe de Jesus, aviadora	3,600	.....	25	30
San Felipe de Jesus, aviada	1,200	.....	.....	10
San Rafael y An., Trompillo	1,200	12.00	990	1,020
San Rafael y An., aviada	1,200	4.00	380	390
Soledad, aviada	960	0.60	375	385
Sorpresa, aviada	960	5.00	310	315
.....	.....	.....	.....	.....

Name of Company.	Shares Issued.	Last div'd	Prices. Bid.	Prices. Ask.
Mexico.				
Alacran	$2,400	.....	35	45
Aldebarran	.....	.....	78	80
Buen Despacho	3,000	.....	60	65
Dos Estrellas	3,000	30.00	2,300	2,400
La Esperanza (El Oro)	3,000	10.00	1,320	1,350
La Reformia, aviadores	2,000	.....	60	68
Providencia, pagadoras	1,000	.....	12	10
Providencia, liberadas	800	.....	12	10
Santa Ana, Esperanza	2,400	.....	70	90
Michoacan.				
Luz de Borda, aviadora	3,000	.....	90	98
Luz de Borda, aviada	1,000	.....	22	25
Nerevo Leon:				
La Fraternal	1,000	.....	600	550
Norias de Bajan	1,000	.....	600	550
Santiago y An., Tlal.	4,000	.....	8	5
San Luis Potosi.				
Concepcion y An.	3,000	.....	85	90
El Barreno, aviadora	2,000	2.00	50	55
Sta. Maria de la Paz	2,400	20.00	715	720
San Diego y Annexas	2,400	4.00	12	20
Zacatecas.				
Asturiana y An.	2,500	.....	80	100
Candelaria y Pinos	2,500	10.00	275	285
Cubiertas	2,400	.....	15	7
Esperanza y An.	2,400	.....	60	70
Lourdes	2,500	.....	25	35
Luz de Minillas, pagadoras	2,000	.....	18	25
Nueva Quebradilla, aviadoras	2,400	.....	42	35
Nueva Quebradilla, aviadas	600	.....	45	40
San Carlos y Annexas	2,500	20.00	145	150
Sta. Maria de Gaud.	2,500	10.00	55	60
Miscellaneous.				
Bartolome de Medina	2,000	1.50	72	75
Guadalupe Hacienda	10,000	6.00	.....	.....
La Luz Hac. (Pachuca)	3,750	.....	280	290
La Reina (Chihuahua)	192	.....	.....	.....
Naica (Chihuahua)	100	.....	11,000	13,000
Natividad (Oaxaca) aviadora	1,800	10.00	700	900
Natividad (Oaxaca) aviadas	600	4.00	700	900
San Francisco Hac.	6,000	1.00	54	56
Santa Ana Huantla Morelos	4,000	.....	.....	.....
Union Hacienda	3,000	5.00	225	240

*Values are in Mexican currency.

SALT LAKE CITY.* June 7.

Name of Company	Shares.	Par Val	High	Low	Sales.
Ajax	300,000	$10	.10½	.10	10,900
Ben Butler	500,000	1	.14	.12½	13,900
California	300,000	1	.14	.13¼	6,400
Con. Mercur	1,000,000	5	1.23½	1.23	2,700
Creole	.....	.....	.....	.....	.....
Comstock	.....	.....	1.45	1.39	600
Daly	.....	.....	1.80	1.80	400
Daly-Judge	300,000	1	11.00	10.50	1,395
Daly-West	300,000	20	46.00	45.55	239
Grand Central	250 000	1	4.70	4.70	100
L. Mammoth	150,000	1	1.98	1.44	64,200
M. Washington	300,000	.....	.....	.....	6,250
Mammoth	400,000	25	1.21	1.15	1,123

Name of Company.	Shares.	Par Val	High	Low	Sales.
Majestic Cop	.....	.....	3.45	3.45	300
May Day	400,000	0.25	.24	.22	26,300
N. Y. Bonanza	.....	.....	.....	.....	.....
Naildriver	.....	.....	1.65	1.65	75
Petro	.....	.....	.....	.....	.....
Sacramento	1,000,000	5	.26	.25	11,800
Silver Shield	.....	.....	.06¼	.06	4,200
Star Con	500,000	1	.37	.30¼	35,300
Uncle Sam	500,000	1	.29¼	.27	5,800
Utah	100,000	10	.69	.69	700
Victor	500,000	1	.21	.20	1,900
Wabash	.....	.....	.23½	.25	6,250
Yankee Con	500,000	1	.41	.39	2,200

All mines are in Utah. *By our Special Correspondent. Total sales, 196,252 shares.

ST. LOUIS, MO. June 6.

Name.	Capital Stock	Par val.	Prices. Bid.	Prices. Ask.
Am. Nettie, Colo	$3,000,000	$10	$0.60	$0.80
Catherine Lead, Mo.	500,000	10	1.80	3.00
Central Coal & C.	1,875,000	100	59.00	62.50
Central C. & C., pf.	1,875,000	100	73.00	74.25
Central Lead, Mo.	1,000,000	10	120.00	130.00

Name.	Capital Stock.	Par val.	Prices. Bid.	Prices. Ask.
Columbia Lead, Mo.	$500,000	10	$12.00	14.00
Con. Coal, Ill.	500,000	100	22.50	23.50
Doe Run Lead Co.	1,500,000	100	107.50	110.00
Granite Bimet. Mt.	1,000,000	10	55.00	.90
St. Joe Lead, Mo.	6,000,000	10	16.00	18.00

*From Our Special Correspondent.

PHILADELPHIA, PA.*

Name and Location of Company.	par val	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 8. H.	June 8. L.	June 9. H.	June 9. L.	Sales
Am. Alkali, Mich	$50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Cement	10	.....	.....	8	7⅞	7⅞	7⅞	.....	.....	.....	.....	.....	.....	440
Cambria Iron, Pa.	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
Cambria Steel, Pa.	50	.....	.....	23¼	22⅞	23	23⅛	22⅝	22⅜	23⅛	23	22¾	22⅛	3,675
Penn. Steel, pfd.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	90	10
Susq. I. & S., Pa.	5	.....	.....	2	2	2	2	2	2	2	2	1⅝	1⅜	310
United Gas I., Pa.	50	.....	.....	90⅝	90	90	89¾	90	89¾	90⅛	90⅛	88	86⅞	6,417
Warwick I. & Steel	10	.....	.....	5	5	.....	.....	.....	.....	.....	.....	.....	.....	700

*Reported by Townsend, Whelen & Co., 300 Walnut St., Philadelphia, Pa. Total sales 11,572 shares.

LONDON. May 29.

Name and Country of Company	Shares Issued.	Par value. £. s. d.	Latest dividend. Amt. s. d.	Latest dividend. Date	Quotations. Buyers. £ s. d.	Quotations. Sellers. £ s. d.
Alaska-Treadwell, g., Alaska	200,000	5 0 0	3 0	Apr., 1903	4 12 6	4 17 6
Anaconda, c. s., Montana	1,200,000	5 0 0	2 0	May, 1903	4 7 6	4 10 0
Arizona, c., Def., ord	63,444	1 0 0	5 6	Feb., 1903	7 15 0	8 5 0
Arizona, pref., ord	316,350	1 0 0	5 6	Feb., 1903	8 0 0	8 5 0
Camp Bird, g., Colorado	738,000	1 0 0	0 7½	May, 1903	1 14 6	1 15 6
Central Chile, c., Chile	276,248	1 0 0	.....	.....	3 0	4 0
Copiapo, c., Chile	112,500	2 0 0	6 10	May, 1903	1 17 6	2 2 6
De Lamar, g. s., Idaho	80,000	1 0 0	2 0	Nov., 1902	10 0	12 6
El Oro, g., Mexico	1,000,000	1 0 0	1 6	Dec., 1902	1 13 9	1 16 3
Frontino & Bolivia, g., Colombia	128,662	1 0 0	3 0	July, 1901	13 9	16 3
Le Roi, g., British Col	200,000	5 0 0	5 0	Nov., 1899	1 5 0	1 7 6
Le Roi No. 2, g., British Col	120,000	5 0 0	5 0	May, 1902	1 3 9	1 6 3
Mesquital, Mexico	250,000	2 0	3	Feb., 1903	3 6	4 0
Montana, g. s., Montana	657,128	1 0 0	6	April, 1899	1 9	2 3
Mountain, c., Cal	250,000	5 0 0	4 0	Nov., 1902	3 2 6	3 7 6
Stratton's Independence, Colorado	1,000,007	1 0 0	6	April, 1902	8 6	9 6
St. John del Rey., g., Brazil	546,265	1 0 0	8	June, 1903	15 0	16 0
Utah Con., g. c., (Highland Boy), Utah	300,000	1 0 0	7 0	Jan., 1903	6 0 0	6 10
Ymir, g., British Col	200,000	1 0 0	1 0	Mar., 1902	7 6	10 6
European:						
Linares, l., Spain	15,000	3 0 0	9	Oct., 1902	2 15 0	3 5 0
Masor & Barry, c., sul., Port'g'l	185,172	1 0 0	11 0	May, 1903	3 7 6	3 12 6
Rio Tinto, pref., Spain	325,000	5 0 0	27 6	Apr., 1903	47 2 6	47 7 6
Rio Tinto, pref., Spain	325,000	5 0 0	2 6	Apr., 1903	6 0 0	6 5 0
Tharsis, c., Spain	625,000	2 0 0	6 0	May, 1903	4 2 6	4 7 6
Australia and New Zealand:						
Assoc. Gold Mines, W. Australia	495,388	1 0 0	1 6	Jan., 1900	1 17 6	1 18 9
Briscis, Tin, Tasmania	600,000	1 0 0	.....	.....	4 3	4 7
Broken Hill Pr'p., s., N. S. Wales	980,000	8 0	1 0	Feb., 1903	1 13 0	1 14 0
Cosmopolitan Prop., W. Australia	385,000	1 0 0	0 6	July, 1902	18 6	19 6
Golden Horse Shoe, W. Australia	300,000	5 0 0	0 6	Apr., 1903	10 7 6	10 10 0
Great Fingall Con., W. Australia	250,000	1 0 0	5 0	Sept., 1902	7 15 0	7 17 6
Great Bo'd'r Pr'p., W. Australia	1,750,000	2 0	6	June, 1903	1 3 0	1 3 6
Ivanhoe Gold Corp. W. Australia	200,000	5 0 0	4 0	Jan., 1903	9 2 6	9 5 0
Kalgurli, g., W. Australia	120,000	1 0 0	2 6	Apr., 1903	4 7 6	4 10 0
Lake View Cons., g., W. Australia	250,000	1 0 0	rts.	Aug., 1902	2 7 6	2 10 0
Mt. Lyell M. & R. L., c., Tasmania	275,000	3 0 0	1 0	Apr., 1903	3 5 0	3 7 6
Mt. Morgan, g., Queensland	1,000,000	1 0 0	3	May, 1903	3 10 0	3 15 0
Waihi, g., New Zealand	497,412	1 0 0	2 6	June, 1903	5 8 9	5 11 3
Indian:						
Champion Reef, g., Colar Fields	473,000	10 0	4 6	May., 1903	7 7 6	7 10 0
Mysore Gold, Colar Fields	530,000	10 0	5 0	Mar., 1903	7 7 6	7 10 0
Nundydroog, g., Colar Fields	484,000	10 0	1 6	Mar., 1903	2 10 0	2 12 6
Ooregum, g., Colar Fields	343,000	10 0	1 6	Apr., 1903	1 13 9	1 16 3
Ooregum, pref., g., Colar Fields	240,000	10 0	1 6	Apr., 1903	2 3 9	2 6 3
African:						
Angelo, g, Transvaal	600,000	1 0 0	6 0	Feb., 1903	7 0 0	7 5 0
Bonanza, g., Transvaal	200,000	1 0 0	12 0	Feb., 1903	4 10 0	4 2 6
British South Africa	4,436,019	1 0 0	rts.	May. 1899	2 17 6	2 18 9
Cape Copper, S. Africa	300,000	2 0 0	1 0	June, 1903	2 18 3	2 18 9
Cape Copper, pref., S. Africa	75,000	2 0 0	1 0	June, 1903	3 2 6	3 7 6
City and Sub'n (New), g., Transvaal	340,000	4 0 0	8 0	Aug., 1899	6 10 0	6 12 6
Crown Reef, g., Transvaal	120,000	1 0 0	11 0	May. 1903	16 15 0	17 5 0
De Beers Con., d., pref., Cape Colony	800,000	2 10 0	10 0	Mar., 1903	19 11 3	19 13 9
De Beers Con., def	1,000,000	2 10 0	12 6	Mar., 1903	21 10 0	21 12 6
East Rand, Prop, Transvaal	970,000	1 0 0	rts.	May, 1902	7 11 3	7 13 9
Ferreira g., Transvaal	90,000	1 0 0	2 0	May., 1903	21 15 0	22 15 0
Geldenhuis Est., g., Transvaal	200,000	1 0 0	5 0	Feb., 1903	6 3 9	6 6 3
Geduld, g, Transvaal	400,000	1 0 0	rts.	Mar., 1902	6 17 6	6 18 9
Henry Nourse, g., Transvaal	125,000	1 0 0	8 0	Feb., 1903	9 0 0	9 5 0
Jagersfontein, d., Orange F. S.	200,000	5 0 0	6 0	Nov., 1899	29 17 6	30 2 6
Jubilee, g., Transvaal	50,000	1 0 0	5 0	June, 1903	5 5 0	5 10 0
Jumpers, Transvaal, g.	100,000	1 0 0	5 0	Aug., 1899	3 10 0	3 15 0
Langlaagte Est., g., Transvaal	470,000	1 0 0	3 0	Sept., 1899	3 18 9	4 1 3
May Con., g., Transvaal	288,750	1 0 0	3 0	Feb., 1903	4 5 0	4 7 6
Meyer & Charlton, g., Transvaal	100,000	1 0 0	3 0	Feb., 1903	5 12 6	5 17 6
Modderfontein, g., Transvaal	290,000	1 0 0	rts.	Apr., 1902	10 7 6	10 10 0
Namaqua, c., Cape Colony	94,331	2 0 0	2 0	June, 1902	2 15 0	3 0 0
Primrose (New), g., Transvaal	325,000	1 0 0	2 0	Feb., 1903	3 16 3	3 18 9
Rand Mines, g., S. Africa	1,795,856	5 0	4 0	June, 1902	10 8 9	10 10 0
Robinson, g., Transvaal	750,000	5 0 0	6 0	Feb., 1903	10 7 6	10 12 6
Robinson Deep, g., Transvaal	950,000	1 0 0	5 0	May, 1899	4 17 6	5 0 0
Rose Deep, Transvaal	425,000	1 0 0	2 0	Feb. 1903	8 12 6	8 17 6
Salisbury, g., Transvaal	100,000	1 0 0	2 0	Mar., 1899	2 10 0	2 15 0
Sheba, g., Transvaal	1,075,000	1 0 0	6	July, 1898	1 1 3	1 2 6
Village Main Reef, Transvaal	400,000	1 0 0	5 0	Oct., 1902	8 11 3	8 13 9
Wemmer, Transvaal	80,000	1 0 0	5 0	May, 1903	12 5 0	12 15 0

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

LONDON. (*By Cable*).*

Name of Company.	June 2. £. s. d.	June 9. £. s. d.	Name of Company	June 2. £. s. d.	June 9. £. s. d.
Anaconda	4 10 0	4 5 0	Johannesburg Invest.	3 1 3	3 0 0
British South Africa	2 18 9	2 13 9	Modderfontein	10 5 0	9 11 3
Camp Bird	1 15 3	1 12 7½	Rand Mines	10 7 6	9 18 3
Con. Gold-Fields	7 2 6	6 12 6	Rio Tinto com	47 5 0	45 17 6
De Beers Con. def	21 7 6	21 5 0	Simmer & Jack	1 11 3	1 9 4½
East Rand	7 10 0	7 3 9	Tomboy	1 15 0	1 12 6
El Oro, Mex	1 13 9	1 13 9	.....	.....	.....
Jagersfontein	30 5 0	29 15 0	.....	.....	.....

*Furnished by Wm. P. Bonbright & Co., 15 Wall St., New York.

PARIS. May 26.

Name of Company.	Country.	Product.	Capital Stock. Francs.	Par value. Fr.	Latest divs. Fr.	Prices. Opening. Fr.	Prices. Closing Fr.
Boleo	Lower Cal.	Copper	.....	500	176.00	1,425.00	1,430.00
Champ d'Or	S. Africa	Gold	3,375,000	25	3.75	21.25	20.75
Fraser River	Brit. Col'mb.	Gold	250,000	25	.....	6.50	6.50
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	102.50	99.00
Laurium	Greece	Zinc, Lead	10,500,000	500	25.00	371.00	347.00
Metaux, Cie. Fran. de	France	Metal dealers	25,000,000	500	22.50	446.00	465.00
Nickel	N. Caled'nia	Nickel	15,000,000	250	22.50	470.00	464.00
Sedalia & California	Calif., U. S.	Oil	1,000,000	1	.....	8.75	8.00
Vielle Montagne	Belgium	Zinc	9,000,000	30	30.00	657.00	644.00

TORONTO, ONT.* June 6.

Name of Company.	par val	Prices. High.	Prices. Low.	Sales.	Name of Company	Par val	Prices. High.	Prices. Low.	Sales.
Black Tail	$1	.05⅛	.02¼	.....	Granby Smelter	$10	510	480	100
Cariboo (Mc. K.)	1	.14	.11	.....	Mountain Lion	1	.28	.20	.....
Cariboo (Hyd.)	1	.75	.75	.....	North Star	1	.14	.10	.....
Center Star	1	31	28	2,000	Nova Scotia Steel, com	100	.85	.77	60
Crows Nest, C.	100	400	300	.....	Payne	1	.16	.14	2,000
Dominion Coal, com	100	.89	77¼	.....	Rambler Cariboo	1	.40	.....	.....
Dominion S. & I.	100	.17	13½	.....	Republic	1	.05	.02	.....
Dominion S. & I., pref.	100	.42	.....	.....	St. Eugene	1	.45	.35	.....
Fairview	1	.05½	.05¼	.....	Virtue	1	.08	.06	.....
Giant	1	.....	.....	.....	War Eagle Con	1	.14	.11	7,000

*Standard Stock and Mining Exchange. Total sales 11,160 shares

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.

(See also Market Reviews.)

ABRASIVES—	Cust.	Meas.	Price.
Carborundum, f.o.b. Niagara Falls, Powd., F.FF.FFF.	lb.		$0.08
Grains	"		.10
Corundum, N. C.	"		.07@.10
Chester, Mass.	"		.04½@.05
Barry's Bay, Ont.	"		.07½@.09½
Mont. car-lots, f.o.b., Chicago	"		.07@.07½
Crushed Steel, f.o.b. Pittsburg	"		.05½
Emery, Turkish flour in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Naxos flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Chester flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Peekskill, f.o.b. Easton, Pa., flour, in kegs	"		.01½
Grains, in kegs	"		.02½
Crude, ex-ship N. Y.; Abbott (Turkey)	lg.ton		26.50@30.00
Kuluk (Turkey)	"		22.00@24.00
Naxos (Greek) h. gr.	"		26.00
Garnet, as per quality	sh.ton		25.00@35.00
Pumice Stone, Am. Powd	lb.		.01¾@.02
Italian, powdered	"		.01½
Lump, per quality	"		.04@.40
Rottenstone, ground	"		.02½@.04½
Lump, per quality	"		.06@.20
Rouge, per quality	"		.10@.30
Steel Emery, f.o.b. Pittsburg.	"		.07
ACIDS—			
Boracic, crystals	"		.10¾@.11
Powdered	"		.11¼@.11½
Carbonic, liquid gas	"		.12½
Chromic, crude	"		.20
Hydrofluoric, 30%	"		.03
48%	"		.05
60%	"		.11
Sulphurous, liquid anhy. f.o.b. Bound Brook, N.J.	"		.06
ALCOHOL—Grain	gal.		2.40@2.42½
Refined wood 95@97%	"		.60@.65
Purified	"		1.20@1.50
ALUM—Lump	100 lbs.		1.75
Ground	"		1.85
Porous	"		.80
Powdered	"		3.00
Chrome, com'l	"		2.75@3.00
ALUMINUM—			
Nitrate	lb.		1.50
Oxide, com'l, common	"		.06½
Best	"		.20
Pure	"		.80
Hydrated	100 lbs.		2.60
Sulphate, com'l	"		1.25@1.50
AMMONIA—			
Aqua, 16°	lb.		.03
18°	"		.03¼
20°	"		.03¾
26°	"		.05½
AMMONIUM—			
Carbonate, lump	"		.07½
Powdered	"		.08¼
Muriate	"		.05⅝
Lump	"		.09
Nitrate, white pure (90%)	"		.12
Phosphate, com'l	"		.09
Pure	"		.12
ANTIMONY—Glass	"		.30@.40
Needle, lump	"		.05½@.06
Powdered, ordinary	"		.05¾@.07¼
Oxide, com'l white, 95%	"		.09½
Com'l white, 95%	"		.12
Com'l gray	"		.07
Sulphuret, com'l	"		.16
ARSENIC—White powd.	"		.03@.03½
Red	"		.06½@.06¾
ASPHALTUM—			
Ventura, Cal.	sh.ton		32.00
Cuban	lb.		.01¼@.03½
Egyptian, crude	"		.05½@.06
Trinidad, refined	sh. ton		35.00
San Valentino (Italian)	lg. ton		16.00
Seyssel (French), mastic	sh. ton		21.00
Gilsonite, Utah, ordinary	lb.		.03
Select	"		.03¾
BARIUM—			
Carb. Lump, 80@90%	sh.ton		25.00@27.50
92@98%	"		26.00@29.00
Powdered, 80@90%	lb.		.01¾@.02
Chloride, com'l	100lbs.		1.67½@1.76
Chem. pure cryst	lb.		.05
Nitrate, powdered	"		.05¼

BARIUM	Cust.	Meas.	Price.
Sulphate (Blanc Fixe)	lb.		$0.01⅞
BARYTES—			
Am. Crude, No. 1	sh.ton		9.00
Crude, No. 2	"		8.00
Crude, No. 3	"		7.75
Floated	"		18.50
Foreign, gray	"		13.50
Snow white	"		17.00
Floated	"		19.00
BAUXITE—Ga. or Ala. Mines:			
First Grade	lg.ton		5.50
Second grade	"		4.75
BISMUTH—Subnitrate	lb.		2.00
Subcarbonate	"		2.25
BITUMEN—"B"	"		.03½
"A"	"		.05
BONE ASH	"		.02¼@.02½
BORAX	"		.07¼@.07½
BROMINE—Bulk.	"		.35
CADMIUM—Metallic	"		1.40
Sulphate	100 lbs.		2.00@2.50
CALCIUM—Acetate, gray	"		1.40
" brown	"		.05
Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jersey City, N. J.	sh.ton		70.00
Carbonate, ppt.	lb.		.05
Chloride	100 lbs.		.70@.90
CEMENT—			
Portland, Am., 400 lbs.	bbl.		2.00@2.15
Foreign	"		1.95@2.50
"Rosendale," 300 lbs	"		.80
Slag cement, imported	"		1.65
CERESINE—			
Orange and Yellow	lb.		.13
White	"		.14
CHALK—Lump, bulk	Sh.ton		3.00
Ppt. per quality	lb.		.04¼@.05¼
CHLORINE—Liquid	"		.30
Water	"		.10
CHROME ORE—			
(50% ch.) ex-ship N. Y.	lg.ton		24.75
Bricks f.o.b. Pittsburg	M		175.00
CLAY, CHINA—Am. com., ex-dock, N. Y.	lg.ton		8.25
Am. best, ex-dock, N. Y.	"		9.25
English, common	"		10.50
Best grade	"		16.25
Fire Clay, ordinary	sh.ton		4.25
Best	"		6.00
Slip Clay	"		5.00
COAL TAR PITCH	gal.		.08
COBALT—Carbonate	lb.		1.75
Nitrate	"		1.50
Oxide—Black	"		2.26@2.30
Gray	"		2.28@2.40
Smalt, blue ordinary	"		.06
Best	"		.20
COPPERAS—in bulk	100 lbs.		.47½
In bbls	"		.52½
COPPER—Carbonate	lb.		.18@.19
Chloride	"		.25
Nitrate, crystals	"		.35
Oxide, com'l	"		.19
CRYOLITE	"		.06½
EXPLOSIVES—			
Blasting powder, A	25 lb. keg		.65
Blasting powder, B	"		1.40
"Rackarock," A	lb.		.25
"Rackarock," B	"		.18
Judson R.R. powder	"		.10
Dynamite (20% nitro-glycerine)	"		.13
(30% nitro-glycerine)	"		.14
(40% nitro-glycerine)	"		.15
(50% nitro-glycerine)	"		.16½
(60% nitro-glycerine)	"		.18
(75% nitro-glycerine)	"		.21
Glycerine for ultro, (32-2-10° Be.)	"		.13¼@.13⅞
FELDSPAR—Ground	sh.ton		8.00@9.00
FLINT PEBBLES—Dan. Best.	lg.ton		14.75
French, Best	"		11.75
FLUORSPAR—			
Am. lump, 1st grade	sh.ton		14.40
2d grade	"		13.90
Gravel and crushed, 1st gr	"		13.40
2d grade	"		12.40
Ground, 1st grade	"		17.90
Ground, 2d grade	"		16.50
Foreign, lump	"		8.00@12.00
Ground	"		11.50@14.00
FULLER'S EARTH	100 lbs.		.80

GRAPHITE—Am. f.o.b. Providence, R. I., lump	Cust. sh.ton	Meas.	Price. $8.00
Pulverized	"		30.00
German, com. pulv.	lb.		.01¼@.01½
Best pulverized	"		.01½@.02
Ceylon, common pulv.	"		.02¾@.03½
Best pulverized	"		.04@.08
Italian, pulv	"		.01¼
GYPSUM—Ground	sh.ton		8.00@8.50
Fertilizer	"		7.00
Rock	lg.ton		4.00
English and French	"		14.00@16.00
INFUSORIAL EARTH—Gr'd.			
American best	"		20.00
French	"		37.50
German	"		40.00
IODINE—Crude	100 lbs.		2.45
IRON—Muriate	lb.		.05
Nitrate, com'l	"		.01¼
True	"		.04
Oxide, pure copperas color.	"		.05@.10
Purple-brown	"		.02
Venetian red	"		.01@.01½
Scale	"		.01@.03
KAOLIN—(See China Clay.)			
KRYOLITH—(See Cryolite.)			
LEAD—Acetate, white	"		.08¼@.08½
Brown	"		.06¼@.06½
Nitrate, com'l	"		.06½
" gran.	"		.08¼
LIME—Com., abt. 250 lbs.	bbl.		.75
Finishing	"		.95
MAGNESITE—Greece.			
Crude (95%)	lg. ton		5.50@6.00
Calcined	sh.ton		17.50@18.00
Bricks best imp., f.o.b., N.Y.	M.		155.00
" domes., per qual., f.o.b. Pittsburg	"		160.@200.
MAGNESIUM—			
Carbonate, light, fine pd.	lb.		.05
Blocks	"		.07@.09
Chloride, com'l	"		.01¾
Fused	"		.20
Nitrate	"		.60
Sulphate	100 lbs.		.75@.95
MANGANESE—Powdered, 70@75% binoxide	lb.		.01¼@.01½
Crude pow'd. 75@85% binoxide	"		.01½@.02¼
85@90% binoxide	"		.02¼@.03¼
90@95% binoxide	"		.03¼@.03½
Carbonate	"		.16@.20
Chloride	"		.04
Ore, 50%, Foreign	unit		.18@.19
Domestic	"		.30
MARBLE—Flour	sh.ton		6.00@7.00
MERCURY—Bichloride	lb.		.77
MICA—N. Y. gr'nd, coarse	sh.ton		33.00@38.00
Fine	lb.		.00¾@.02
Sheets, N. C., 2x4 in.	"		.30
3x3 in.	"		.80
3x4 in.	"		1.50
4x4 in.	"		2.00
6x6 in.	"		3.00
MINERAL WOOL—			
Slag, ordinary	sh.ton		19.00
Selected	"		25.00
Rock, ordinary	"		32.00
Selected	"		40.00
NICKEL Oxide, No. 1	lb.		1.00
No. 2	"		.60
Sulphate	"		.20@.21
OILS—Black, reduced 29 gr.			
25@30, cold test	gal.		.13@.13½
15, cold test	"		.13½@.14
Zero	"		.18@.18½
Summer	"		.12½@.13
Cylinder, dark steam ref.	"		.14½@.15
Dark, filtered	"		.18½@.19
Light, filtered	"		.20½@.20
Extra cold test	"		.25@.31
Gasoline, 86°@90°	"		.16@.21
Naphtha, crude, 68°@72°	bbl.		11.20
"Stove"	gal.		.14½
Linseed, domestic raw	"		.41@44
Boiled	"		.46
Calcutta, raw	"		.75
OZOKERITE	lb.		.11½
PAINTS AND COLORS—			
Chrome green, common	"		.03
Pure	"		.16
Yellow, common	"		.10¼
Best	"		.14
Lampblack, com'l	"		.04½
Refined	"		.07
Litharge, Am. pow'd	"		.05⅝@.06
English flake	"		.08¼@.08½
Glassmakers'	"		.06½@.08¼

PAINTS AND COLORS—	Cust.	Meas.	Price.
Metallic, brown	sh.ton		$19.00
Red	"		16.00
Ocher, Am. common	"		9.25@10.00
Best	"		21.25@25.00
Dutch, washed	lb.		.04¾
French, washed	"		.01½@.01⅞
Orange mineral, Am.	"		.08¼@.08¾
Foreign, as to make	"		.08½@.10¼
Paris green, pure, bulk	"		.12
Red lead, American	"		.06¼@.06½
Foreign	"		.06⅝@.06⅞
Turpentine, spirits	gal.		.49@.49½
White lead, Am., dry	lb.		.05½@.05¾
American, in oil	"		.07@.09
Foreign, in oil	"		.07@.07¼
Zinc, white, Am., ex dry	"		.04⅝@.04¾
Foreign, red seal, dry	"		.06@.08½
Green seal, dry	"		.06½@.09½
POTASH			
Caustic, ordinary	"		.04½@.04⅞
Elect. (90%)	"		.06¼
POTASSIUM—			
Bicarbonate cryst	"		.08¼
Powdered or gran.	"		.14
Bichromate, Am.	"		.08¼@.08¼
Scotch	"		.08½@.09
Bromide, bulk	"		.25
Carbonate (80@85%)	"		.03½@.04
Chlorate, powd.	"		.07¼@.07¼
Crystals	"		.07@.07¼
Chromate	"		.35
Cyanide (98@99%)	"		.20
Kainit	lg.ton		9.30
Manure salt, 20%	100 lbs.		.66
D'le Manure Salt, 48@53%	"		1.12
Muriate, 80@85%	"		1.83
95%	"		1.86
Permanganate	lb.		.09½@.09⅝
Prussiate, yellow	"		.13¼@.13½
Red	"		.34
Sulphate, 90%	100 lbs.		2.11
96%	"		2.14
Sylvanit	unit		.41
QUARTZ—(See Silica).			
SALT—N. Y. com. fine 280 lbs	bbl.		.72@1.18
N. Y. agricultural	sh.ton		4.40
SALTPETRE—Crude	100 lbs.		3.20@3.35
Refined	"		4.00@4.50
SILICA—Best foreign	lg.ton		10.00@11.00
Ground quartz, ord.	sh.ton		6.00@8.00
Best	"		12.00@13.00
Lump quartz	"		2.50@4.00
Glass sand	"		2.75
SILVER—Chloride	oz.		.65
Nitrate Crystals	"		.34½
Oxide	"		.85@1.10
SODIUM—			
Bicarb., ordinary, f.o.b. w'ks	100 lbs.		1.25
Extra domes, f.o.b. w'ks	"		3.50
Foreign, f.o.b. N. Y.	"		1.80
Bichromate	lb.		.06¼
Carbonated ash, high test, in bags, f.o.b. works	100 lbs.		.75@.82½
Foreign, f.o.b. N. Y.	"		.90@.92½
Caustic, 60@78%, f.o.b. w'ks	"		1.70@1.75
Foreign, f.o.b. N. Y.	"		1.90@2.00
Chlorate, com'l	"		.07¼@.07⅝
Hyposulphite, Am.	"		1.60@1.65
German	"		1.70@1.80
Nitrate, spot	"		2.10@2.15
Shipments	"		2.00@2.02½
Peroxide	lb.		.45
Phosphate	"		.02½@.02¾
Prussiate	"		.09¾
Sal soda, f.o.b. works	100 lbs.		.55
Foreign, f.o.b. N. Y.	"		.67½
Silicate, conc.	lb.		.05
Com'l	"		.01
Sulphate, com'l	100 lbs.		82½
Sulphide	lb.		.01¼
Sulphite crystals	"		.02½
SULPHUR—Roll	100 lbs.		1.85
Flour	"		1.90
Flowers, sublimed	"		2.15
TALC—N. C., 1st grade	sh.ton		18.00
N. Y., Fibrous, best	"		10.20
French, best	100 lbs.		1.25
Italian, best	"		1.62½
TAR—Regular	bbl.		2.40
Oil barrels	"		4.40
TIN—Crystals	lb.		.22½@.23
Oxide	"		.45
URANIUM—Oxide	"		2.25@3.00
ZINC—Metallic, ch. pure	"		.07@.07¾
Carbonate, ppt.	"		.06
Chloride solution, com'l	"		.02¼
Chloride granular	"		.04¼@.04⅜
Dust	"		.04⅝@.04½
Sulphate	"		.02½@.03¾

THE RARE EARTHS.

BORON—Nitrate	lb.		$1.50
CALCIUM—Tungstate (Scheelite)	"		.60
CERIUM—Nitrate	"		10.00
DIDYMIUM—Nitrate	"		55.00
ERBIUM—Nitrate	"		40.00
GLUCINUM—Nitrate	"		30.00
LANTHANUM—Nitrate	"		30.00
LITHIUM—Carbonate	"		1.35
LITHIUM—Nitrate	oz.		.60
STRONTIUM—Nitrate	lb.		.07¼@.08¼
THORIUM—Nitrate 49@50%.	"		4.50
URANIUM—Nitrate	oz.		.25
YTTRIUM—Nitrate	lb.		40.00
ZIRCONIUM—Nitrate	"		8.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.